ELEANOR T CALVERLEY, M D

HOW TO BE HEALTHY IN HOT CLIMATES

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To my husband

EDWIN ELLIOTT CALVERLEY PH D

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INTRODUCTION

IN 1819 when Melvin Cox after only two years in Liberia Africa lay dying from tropical fever he sent the fervent message back to America Though a thousand die let not Africa be given up During the past 125 years hundreds of pioneers from temperate zones have gone to tropical areas and have suffered untimely death because of ignorance of the conditions they were to face and of any adequate methods by which they could avoid or cure those strange maladies that infested the hot and humid areas of the tropical and subtropical zones

Climate has been a tremendous factor in speeding human progress in some areas and in slowing it in others The tropics have been considered one of the backward areas However an intelligent understanding of the malarias the dysenteries and many others in that long list of illnesses chiefly restricted to the tropics has displaced the old attitude that chronic recurring illness and lack of physical vigor was the expected thing in hot climates Nearly every year brings word of new victories of medical science Now we are further strengthened by the triumphs of medical research as a phase of World War II Great resources of money and mind were brought to bear on tropical diseases and the barriers of ignorance were pushed back still further There never has been a time when life in the tropics offered so few peculiar threats to life and health as today

Some detailed studies of the health experiences of a group of 1279 missionaries who spent an average of seventeen years each in foreign lands show that people from more northerly climes can prosper and enjoy good health in hot climates Although dysentery in its various forms is widely prevalent in

these countries only 29 per cent of the men and 27 per cent of the women suffered from it Malaria is another great source of tropical morbidity and in Africa it appears at its worst In that continent 75 per cent of the workers suffered from it at some time in India 52 per cent and in China 28 per cent. From all lands there was an average of 36 per cent of the personnel who had some illness due to the ubiquitous mosquito Counting all the ill health experiences suffered by this group with its total of 22 000 years of service we note that the men had 48 illnesses per 100 years of service and the women 67 This is not a record that should create fear of the tropics But still there is a field for better education in prevention of these common ailments which still do require both vigilance and intelligence

Dr Eleanor Taylor Calverley has brought a most valuable contribution to this effort to maintain health and vigor in hot climates She spent twenty years in the practice of medicine as a medical missionary in Arabia with the Reformed Church At Kuwait she founded the American Hospital for Women and there for eighteen years rendered a large and varied health service Besides gaining much experience in treating the sick she demonstrated by her three healthy children whom she brought safely to maturity that she was acquiring wisdom in the great field of preventive medicine as well Then followed fifteen years of teaching health to missionaries in the Kennedy School of Missions She therefore approached her task well equipped to perform it

This book is very timely and practical It answers those questions that the earnest inquirer would ask as he undertakes a trip or a sojourn for a few or for many years in areas where heat and humidity are high Those of us who have been immersed for many years in these particular health problems welcome heartily Dr Calverley s contribution to this interesting and important field of human welfare

JOHN G VAUGHAN M D
Late Director
Associated Mission Medical Office

PREFACE

At a time when the author was searching for a layman s text book on tropical diseases and hygiene in the tropics Dr Ed ward M Dodd suggested Why don t *you* write a book? Since there seemed to be no adequate manual dealing with life in the tropics the author wrote a mimeographed syllabus for her missionary students Dr Ralph W Nauss of Cornell University Medical College advised her in this project

Some years later while attending the New York Postgradu ate Medical School the author discussed revision of the syl labus with Dr Z Taylor Bercovitz director of the course in tropical diseases He suggested the need for a book on the sub ject for the use of commercial groups sending workers to the tropics

It was Dr W F Clothier of Africa who reviewed the first outline for the book A year later Dr J G Vaughan Director of the Associated Mission Medical Office contributed valuable assistance in the formation of the present outline A part of Chapter 9 is his direct contribution as will be seen from the text Dr J A Curran President and Dean of the Long Island College of Medicine was another who gave encouragement and help in the early days of writing the book Both he and Dr Vaughan had practiced medicine in China Dr Margaret Gibbons of India also helped at this time

A missionary doctor—often the only physician in a city and for many miles around—must try to be something of a special ist in everything During the years she spent in Kuwait an Arabian town the author had the privilege of caring for a healthy family and a home in her capacity of wife and mother On the other hand (or *with* the other hand) as Doctor Lady

she dealt with a hundred or more sick Arabs in a day

Such a general practitioner acquires at least a passing acquaintance with nearly all the subjects connected with health and disease but in offering to the public a book covering so wide a field the author was faced with painful realization of her own limitations On that account she made bold to ask the best specialists for help

Dr Wm G Lennox Assistant Professor of Neurology in the Harvard University Medical School and formerly a missionary in China was consulted on Chapters 1 2 and 6 It was he who compiled the statistics on which much of the information in these chapters is based In matters relating to mental hygiene valuable assistance was furnished also by Dr C C Burlingame Psychiatrist in Chief of the Institute of Living in Hartford Conn To Eleanor Hope Johnson Ph D Associate Professor Emeritus at the School of Religious Education of the Hartford Seminary Foundation thanks are also due

Credit for much of the material in the chapter on Food for Health is due to Miss Hazel M Hauck Professor of Food and Nutrition at the New York State College of Home Economics at Cornell University Dr Josephine Hemenway Kenyon a leading pediatrician graciously consented to read and advise on the chapter A Family in the Tropics

There was one aspect of this book on which the author had some misgivings Those who live in the tropics are frequently situated in places where medical care is unavailable The question of giving instructions in medical procedures which normally lie within the province of none except qualified doctors is a delicate one Would physicians understand and approve such an effort?

Dr Douglas N Forman formerly a medical missionary in India and now secretary of the Christian Medical Council for Overseas Work after reading Chapters 12 13 and 14 wrote You have struck a nice balance a little to the left of center We have gone on the whole further to the left than you have I feel that you need have no fear on that score

Acknowledgment of suggestions and amendments is made to Dr Louis P Dame formerly missionary surgeon and later

physician to the Bahrein Petroleum Company in Arabia for material on minor surgical procedures to Dr Edward Ziegler Professor of Obstetrics at the University of Pittsburg and to Dr E Myles Standish and Dr William L Gills dermatologist and ophthalmologist respectively in Hartford for the sections dealing with their specialties

Dr John Austin Kerr of the International Health Division of the Rockefeller Foundation in charge of antimalaria projects of the foundation in Egypt read and helped revise the chapter on malaria and blackwater fever For the last four chapters on tropical diseases hearty thanks are due to Dr Julia Morgan Associate in Internal Medicine at the University of Pennsylvania Medical School for bringing that part of the book up to date

When the manuscript was finished Dr Clement C Chesterman an English physician with experience in Africa and author of *Tropical Dispensary Handbook* read it with approval suggesting some changes and additions

A number of authorities other than physicians have helped in the writing of this book Professor H W Vandersall Professor of Physics in the American University at Cairo Egypt contributed advice about the selection of electrical equipment in Chapter 3 In the same chapter the Rev T M Moffatt Ph D drawing on his experience in meeting customs requirements in India gave advice about the packing of equipment

A list of those who have through their interest and valued suggestions given assistance would be incomplete without some mention of the author s students In almost every tropical and subtropical country of the world there will be some of them who will read these pages They will recall class discussions in which they told of local conditions in their own lands and of the solutions of problems which they had met They will be glad—these who are truly the salt of the earth —to know that knowledge shared by them is now sent out for the benefit of others who will follow in their steps

ELEANOR T CALVERLEY

CONTENTS



IS IT SAFE TO LIVE IN THE TROPICS?

YOU'LL MAKE a good meal for some cannibal! The remark was made in fun to a young doctor preparing for service in Arabia but it well illustrates the vague fears with which most of us regard the tropics a region of extreme heat and mysterious deadly diseases

If you intend to go to a hot country how can you reassure yourself and your friends as to your relative safety and comfort? Will it be safe to live in such a climate? What precautions can you take and against what? The answer to these questions must depend on several considerations First where exactly are you going? What sort of person are you and what preparation will you have for the life in such a place?

Where Are You Going?

It is quite possible that you may receive an agreeable surprise The regions generally known as the tropics vary greatly in respect to climate living conditions and potential disease hazards Moreover some sections may prove particularly dangerous to some people while others may live there in relative safety

Climate The words *tropics* and *tropical* will be used in this book in a broad sense as denoting places in hot parts of the world irrespective of latitude or average annual temperature

One of the circumstances affecting climate is altitude In India for example a few hours travel can take one from the intense heat of the lowlands to the delightful coolness of snow

covered mountains Even at sea level and with equal degrees of temperature climates vary greatly in respect to humidity A temperature of 90 degrees [1] where the air is moist may be much more uncomfortable than a far higher temperature where the air is dry

Prevailing winds are another modifying factor A cool breeze from the sea can make life quite pleasant in some hot parts of the world but where mountains shut off all cooling air currents the average Westerner is compelled to go away on vacation during the worst months In other places there may be times when a scorching wind blowing over the desert burns up the countryside

It is unlikely that the foreigner will be expected to live in a trying climate without the respite of an occasional holiday But if the prospective traveler has any misgivings about his ability to adjust to whatever climatic conditions he may meet he should make inquiry about the specific circumstances in the place he expects to visit

Living Conditions In a metropolis such as Bombay or Cairo the chances are that you will live in a modern apartment with most of the conveniences Your way of life in such a case may be very similar to what it has been at home

Even in places remote from the city you can have pleasant living quarters Few people today are pioneers Those who have gone before have usually established a pattern of living much like that which they had known at home It should be stated however that some adjustment must be made no matter how favorable the situation And only those with a high degree of adaptability and much resourcefulness should be sent to the more difficult stations where there may be appreciable deprivations

Potential Disease Hazards Many foreigners experience no ill effects from living in hot countries The first five years are the decisive period If one remains in good health during these years he may well be given a preferred insurance rating

Statistics are needed in order to evaluate potential hazards

[1] Temperatures given refer to the Fahrenheit scale unless otherwise indicated

in any particular location Dr Wm G Lennox *The Health and Turnover of Missionaries* [2] contains graphs and information indicating proportionate causes of death and invaliding illnesses occurring in those parts of the world that we have in mind

Degenerative Conditions It will be seen from these graphs that the largest number of deaths and the next to largest number of withdrawals are due to degenerative conditions including some diseases of the heart the blood vessels the kidneys and the like Such diseases are likely to occur with advancing years in any place but in hot countries the process of degeneration may have been speeded by an unfavorable environment

Common Infections Next to degenerative disease as a cause of death and fourth in the graph of invaliding illnesses are the common infections which occur frequently outside the tropics

Tropical Infections The third section in both graphs is allotted to tropical infections Although these constitute the class of hazards most closely associated with tropical countries some of them occur in the temperate zones It should be remembered too that this record covers a period when many of today s facilities for immunization and for treatment of disease were unknown

Today we can be vaccinated against a number of tropical infections The use of DDT as an insecticide which appreciably cut down infestations and illness in the armed forces during World War II should do much to maintain health in the future New drugs are now available for treatment and air travel should to an increasing degree make it possible to secure medical and surgical care quickly even for those who live far from hospitals and doctors Nevertheless it would be foolish to ignore tropical infections as potential hazards Accordingly the cause prevention recognition and treatment of many of these diseases will be considered in this book

Functional Nervous Disorders It is perhaps surprising to note that in Dr Lennox report 29 per cent of the invaliding conditions fall into the category commonly known as nerves

[2] Methodist Book Concern New York.

[2]

PREPARATION FOR LIFE IN THE TROPICS

JUST AS special qualifications are needed for life in the tropics so special preparations are obviously desirable The first of these should be a thorough physical examination After this provided acceptance of the applicant is assured three further measures should be taken These are health service including correction of defects and abnormalities discovered by the doctor immunization against certain diseases and education in tropical hygiene

The Health Examination

Most organizations provide the applicant for tropical service with a printed form on which results of the physical examination are to be recorded by the physician This schedule begins with questions about age and weight The immature are at a disadvantage under circumstances demanding unusual physical stamina Women under twenty one especially are said to have low resistance to heat and humidity Persons over forty also may find it difficult to make adjustment to the tropics The overweight and the undernourished also are less well adapted for enduring hot climates

While the doctor s examination will be made with care there are certain minor disabilities which can best be determined by the individual himself A good digestion is particularly important Those with sluggish livers irritable colons or a history of gall bladder disease which may recur are unlikely to thrive in the tropics

Undiscovered tubercular infection is likely to flare up after one has reached the tropics If there is any uncertainty on this point an X ray study of the chest is advisable Sinus trouble asthma and chronic bronchitis are likely to become more troublesome in warm and humid climates

Health Service—Correction of Abnormalities

Any physical defect which may cause trouble later should be corrected if possible before one goes to the tropics Operations for such conditions as diseased tonsils hemorrhoids (piles) chronic appendicitis or hernia (rupture) should not be put off Trusses for control of hernia are not satisfactory for use in hot climates

A complete dental survey should be made and the teeth should be in as nearly perfect condition as possible When dentures are needed the provision of duplicates is a wise precaution to insure against breakage For those who wear glasses it is a good idea to take along at least two pairs In any event a copy of the prescription for glasses should be retained for future reference

Special Service for Women Women married or single should receive a thorough pelvic examination Menstrual difficulties or other related handicaps ought to receive careful attention A warm climate may have a beneficial effect on periodic pain due to spasm but on the other hand excessive bleeding is likely to increase under these circumstances When the latter condition is due to tumor however slight rapid growth is likely to occur after one reaches the tropics and serious hemorrhage may begin at a time when surgical assistance is not available Much of this trouble can be avoided at the outset by a simple operation

Immunization Against Disease

Before beginning his journey the individual may receive a series of injections to make him immune to some of the most dangerous diseases to which he may be exposed In rare cases where a disease is contracted despite such preventive measures symptoms are usually mild and the illness is not severe Most

governments today require certificates of immunization from travelers entering their countries

The reader should consult with the organization sending him concerning the course of injections he is to take since specifications vary and are changed from time to time to meet current requirements It is well to have the course finished three weeks before the expected date of embarkation Since the normal interval between the first and last injection is six weeks an appointment with the doctor cannot be put off until the last minute

Most of us suffer little real inconvenience from these injections The first and second doses of typhoid paratyphoid vaccine are the two most likely to cause chills fever and headache Even these cause some people no discomfort other than a red and swollen arm which is not truly painful

Vaccination against bubonic plague is not generally required except when one anticipates exposure to an epidemic Immunity in this instance is short lived hence vaccine administered long before exposure is ineffective Cholera vaccine also gives a relatively brief protection and those who reside in regions where cholera is a constant danger should be vaccinated at intervals of six months

Repeat Vaccination Against Smallpox Permanent protection through immunizing procedures cannot be taken for granted of course Where possibility of infection is ever present frequent revaccination is the only real safeguard for both adults and children

Vaccination of babies against smallpox should be begun early in the first year of life sometimes at the age of ten days For thousands of native children yearly are killed blinded or disfigured for life by this disease When a first *vaccination is* unsuccessful it should be repeated until a definite take results The doctor at your future home may advise *yearly* smallpox vaccination and in any case such a procedure can do no harm In regions where smallpox is uncommon an interval of three years is usually sufficient

Repeat of Typhoid Vaccination Typhoid and paratyphoid

fevers are constant dangers amid unsanitary surroundings Whether the usual course of three injections of typhoid paratyphoid vaccine is given at intervals of two years or one injection yearly is given should be left to the discretion of your doctor Children should be protected at the age of three months or at the latest when they can walk

Booster Doses A booster dose of any vaccine or toxoid may be administered in times of acute danger from a particular infection Thus a special injection of tetanus toxoid is advisable in cases of gunpowder wounds or those which may have come in contact with soil although the regular course has been previously given

Certificates of Immunization It is understandable that some record is needed concerning all previous inoculations of a person Certificates written on your doctor s professional paper and signed by him should be obtained in duplicate Full information should be given on these certificates including number of injections dates given and disease against which one is inoculated One of your copies probably will be surrendered before you begin your journey The other is best kept in a waterproof container on your person Without it you may be compelled to repeat injections unnecessarily at some future date

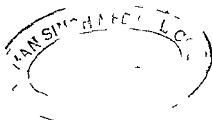
Education in Tropical Hygiene

The best safeguard against diseases for which we have no vaccination is education Certain sanitary and hygienic measures are effective in preventing illness Where malaria is a hazard the use of a mosquito net may easily prevent that disease The boiling of milk and water used for drinking purposes is one of the measures that can prevent dysentery A balanced diet can do wonders in building up resistance against disease

In sections where medical care is constantly at hand a knowledge of preventive measures first aid and home nursing is the most that is required Those in remoter regions may be thrown upon their own resources For this reason detailed in

struction beyond that usually needed is given in later chapters of this book

In closing this chapter one warning word! While the study of disease and its prevention and cure is essential a concentration on the possible ailments of the body leads to disease mindedness Says Dr Lennox Introspection is perilous— Practices that make for physical health should be learned made a habit and then forgotten Begin *now* to work and play to eat and sleep as you know you should The mere crossing of an ocean will not make a careless person into a conscientious one Train yourself then in sane and sanitary habits and in healthy thinking about your body!



[3]

EQUIPMENT FOR THE TRAVELER

Passport and Travelers Checks

Application for your passport should be made some months in advance of the anticipated date of departure Apply for visas from the consular authorities of each of the countries that you may visit en route Such visas are required for going ashore while in port in any country even though one does not make a stop between ships or travel through it

Travelers checks are the safest and most convenient way to carry money Check numbers should be noted and carried separately from the checks in case of loss or theft The loss of passport travelers checks or money is a serious matter While on shipboard leave these with the purser At all other times carry them in a pocket that is securely fastened

How to Plan

Selection and packing of supplies is a matter that varies according to circumstances Advice should be sought from persons acquainted with the place to which you are going For the actual voyage luggage such as suitcases steamer trunk and canvas duffel bag may be kept in the cabin Larger trunks and packing cases are stored in the ship's hold House furnishings and such are usually packed in boxes and sent off by freight months in advance of the passenger

Planning for Enjoyment and Comfort You will need books newspapers and magazines They may have to take the place of

lectures conferences conversation and other means of keeping up to date Subscribe to as many publications as you can afford particularly those dealing with your work or hobbies Don t neglect periodicals in the lighter vein they can be as important to you as the serious Persons who have children should keep them in mind too when considering a choice of reading matter

For those who love music a phonograph is a *priceless possession* Records packed carefully with plenty of corrugated paper for padding can be shipped without breakage And don t forget a supply of phonograph needles

Electrical Equipment [1] Before you pack your electrical appliances determine whether electric current is available in the region where you are to live If so is the current direct or alternating what voltage and frequency? Most equipment manufactured for use in the United States is for 110-volt 60 cycle frequency In foreign countries this current is very often not found

In many devices the voltage for alternating current can be adjusted by a transformer Let an electrician advise you on this point tell him what current is available and what devices you wish to use In the matter of radios it is better to consult the manufacturer rather than a dealer The factory can supply an attachment which will give good performance many dealers are unfamiliar with the problem since it never arises in the States

It is wise to consult a dealer as to whether it is more practical to change or adapt the equipment to the available current or to install a transformer He will need the following information *about the current in use at your destination*

Is current direct or alternating?
What is the voltage?
What is the cycle?
What is the phase?

[1] For the following information we are indebted to Professor H W Vandersall Professor of Physics at the American University at Cairo Egypt

Household Needs For those who expect to set up homes of their own some kind of refrigeration is greatly to be desired Where electric current is not available a refrigerator operated by kerosene may be used Where ice is manufactured an ice box can be made to serve the purpose

Oil heaters during a cold or rainy season are a genuine comfort Although your cook may use wood or charcoal as fuel an oil stove with an oven will be an inestimable convenience A generous supply of wicks and replacements for parts that may wear out should be provided too

A meat grinder is essential in places where meat is nearly always tough It is also a good idea to take along a half dozen of such perishable and inexpensive items as strainers and egg beaters

Packing

Companies specializing in exporting to foreign countries are equipped to pack efficiently but even these should be cautioned to use more than the usual care with goods to be shipped to the tropics Any goods which are to be packed by the individual himself should be boxed with great care As a rule small boxes are preferable to larger and more cumbersome ones Fastening them with screws will facilitate customs inspections Hinges and padlocks may be used on covers but padlocks are sometimes broken off during the journey Boxes should be lined with waterproof material such as tarred paper or oilcloth

For your own use you will wish to have a list of the contents of each box On the other hand for the purpose of customs declaration all articles of the same sort should be listed together (glass and crockery household linen etc) regardless of the container The approximate value of each group should be stated Make a point of inquiring about the customs regulations in the particular country to which you are going

Wearing Apparel

Warm Clothing Provision should be made for cold days even in the tropics At one stage or another the traveler is

likely to feel the need for a warm coat and a sweater even a steamer rug A waterproof coat will serve against cold as well as rain A garment can be waterproofed by soaking it in water containing 5 ounces of wool fat (lanolin) to the gallon and then hanging it up to dry

Cool Clothing Perspiration in the tropics necessitates frequent changes of outer clothing as well as of undergarments The latter should be of the thinnest most porous materials Clothing that can be washed out overnight and if necessary worn without ironing is desirable if the journey will be long Crepe jersey and seersucker are examples of materials that fill these requirements For travel it is advisable to wear colors which will not appear soiled too quickly but for permanent residence light colors are coolest White absorbs the least heat and has the added advantage of remaining attractive when through frequent laundering other colors have faded

Dresses for women in the tropics call for lines that will look well without tight foundation garments However few articles of one s wardrobe need be left behind There are times when almost any type of clothing will be useful

Formal Dress Pack at least one formal evening costume where it will be available during the voyage It is customary to dress for the Captain s dinner on the last night of an ocean voyage At your destination too however out of the way it may be evening clothes may be socially essential Extreme décolletage is unsuitable especially in those countries where it is the custom for women of the country to veil their faces

Sunglasses Hats Topees and Umbrellas Sunglasses should always be available Perhaps at some tropical port en route you will feel the need for a topee or sun helmet as a protection against the sun It is better to wait and buy one of the particular style in favor at your place of destination except in cases of real need Wearing an ordinary hat and carrying an umbrella when the heat is intense is usually sufficient

Shoes Shoes present a major problem for those who live in distant places An adequate supply of footwear for all kinds of weather and for all occasions is eminently desirable Those with entirely normal feet may adapt themselves to the foreign

make of shoes but many residents find it desirable to make arrangements with a good shoe store to keep a record of the size and kind of shoe they need so that supplies can be ordered at intervals

White shoes of canvas or linen are coolest Sizes for hot weather should allow for a little swelling of the feet owing to the heat With suits coats and dresses the opposite is true—they are better made to fit snugly or they will be too loose after the warm climate has had its usual slimming effect

Needs en Route

While there is little difficulty or danger in travel today one may anticipate some problems Some ships for instance come equipped with bedbugs Keatings powder or Flit acts quickly in such cases while DDT in talcum powder can be used for a more lasting effect and is excellent as a protection against lice (see page 41) Halazone tablets enable the traveler to sterilize dubious drinking water (see page 36)

When nights along the way are to be spent in hotels or other shelters in malarial regions it is wise to acquire a bed net or mosquito bar before beginning the journey When exposure is unlikely it is satisfactory to wait until later to make the purchase

Your First Aid Kit

This is required equipment A small tin box such as is sold commercially will serve the purpose It should contain the following (1) a small bottle of antiseptic (mercurochrome is usual but tincture of Zephiran or 2% tincture of iodine is better) (2) aromatic spirits of ammonia in bottle or ampules (3) a tube of burn ointment (4) compact supplies of sterile cotton bandages individual dressings with adhesive plaster and a few sterile gauze compresses and (5) a small roll of adhesive tape and a pair of scissors

Desirable additions will include a clinical thermometer a mild laxative aspirin tablets and soda mints Persons with children may need castor oil syrup of ipecac (for children

subject to croup) Vaseline boric acid in powder or tablet form and a combined hot water bottle and fountain syringe

Summary

From the foregoing it will be seen that generalization concerning the needs of the traveler is out of the question Each should get as much information as possible about the place to which he is going and the circumstances under which he will live He can then form some picture of his future needs and choose his equipment with intelligence

THE JOURNEY

Life on Shipboard An ocean voyage can be the most restful of holidays or it can be an ordeal because of seasickness A new remedy for motion sickness named Dramamine (Searle) will usually prevent this unpleasant malady Tablets containing 50 mg twice a day will keep most people comfortable Dr Victor Heiser suggests that the sufferer who is compelled to seek his bed because of nausea should lie with the feet higher than the head even while eating

Seasickness is definitely not an imaginary ill but one s mental attitude is an important factor in dealing with it Do not be a defeatist! Get up if you possibly can Go out on deck and walk breathing the invigorating sea air before a meal Eat something every meal time Between meals stay out in your deck chair Join in games of deck tennis or quoits Take exercise by pacing the deck Such distractions serve to prevent one s mentally waiting to feel the first symptoms of seasickness

Going Ashore After days or weeks at sea the first sight of land fills everyone with the desire to go ashore In very warm ports such as those East of Suez certain precautions should be observed If you have no topee be sure to carry an umbrella between 10 A M and 4 P M while the sun is overhead

Refreshments Ashore One becomes thirsty on hot days after walking in the sun but it is wise to wait until returning to the ship before taking refreshments If you must drink let it be tea or coffee since the water in these will have been boiled Bottled drinks of known makes with unbroken seal are also

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safe Avoid iced drinks since the water used for ice may be contaminated with germs of dysentery typhoid or cholera

The eating of raw fruits is unwise except those such as oranges or bananas whose outer skin can be removed Melons are sometimes pricked full of holes and soaked in unsafe water to increase their weight before being sent to market Salads made of leaves or vegetables growing close to the ground are the most dangerous of all uncooked foods because of the com mon practice of using night soil as fertilizer

Wash your hands before eating In places where intestinal diseases are common disease producing organisms are likely to be on almost anything you touch Form the habit of washing your hands frequently and keep your hands away from the mouth or eyes But avoid going to ridiculous extremes in these practices

Germs vs Worry Don t develop a phobia about germs One anxious housewife asked what disinfectant she should use for washing dishes in her new Middle Eastern home! The usual soap and hot water are quite adequate for this purpose except in special cases of illness Another timid individual invalided home largely because of emotional instability refused to take his books with him fearing they might have been contami nated by contact with polluted air

There are times when you may have to take a chance with germs In such a case do not frighten yourself into a state of panic Someone has described worry as a circle of inefficient thinking whirling about an axis of fear This state of mind sometimes does more harm than bacteria It never helps

The majority of travelers make the journey to their destina tion under competent supervision Extra money spent for transportation and hotel accommodations through depend able agencies is not wasted Cut rate companies may have poorly trained cooks and inadequate refrigeration of food Luxury is not essential precaution against disease is

SUGGESTED READING

Victor Heiser M D *An American Doctor's Odyssey* W W Nor ton & Company Inc. New York 1936

E. T Burke and Wm Huneman *Tropical Tips for Travel* Medical Books Ltd London 1942
Alfred E. Reed *Health for Travelers* J W Stacey Inc San Francisco 1931 (publisher is no longer in business)

[5]

ADJUSTING TO THE NEW ENVIRONMENT

UPON ARRIVAL *at one s destination one finds his future friends* and associates living normally and successfully in this unaccustomed place He finds that these people go about their work and recreation with easy friendliness despite the intense warmth which seems to him so uncomfortable How is it that they do not break down give up the job which brought them to this place?

One answer is that they have learned to emulate the nationals of the country in their daily routine Although these residents rise at the first hint of dawn they live at a more leisurely pace than is customary in cooler climates At noon the shops and offices are closed for several hours It is the time for lunch and a siesta

As an example of the routine that one may expect the following is typical of the life of an English household in India Awakened early by a manservant bringing in a tray one is served a breakfast—tea toast with butter and marmalade fresh fruit This is the chota hazri or little breakfast When one has bathed and dressed this cooler part of the morning is devoted to the more strenuous part of his exercise and work *A few hours later breakfast is served a hearty meal beginning* with porridge as a rule Then work is resumed

At one or two o clock lunch or tiffin is served After this meal most people retire for an hour or more of rest before returning to work The next pause in the day s work is at four or five o clock when afternoon tea is taken This is the hour

for receiving guests and relaxing in an atmosphere of pleasant hospitality

Very busy people may have to return to work but as the day grows cooler many go out for a ride through the countryside or play tennis or badminton Then after a shower and change of clothes one is ready for dinner at around eight o clock Earlier it is usually too warm for enjoyment of the evening meal The remainder of the evening is given over to entertainment and recreation

Wherever you may go in the tropics you will find such a schedule with minor modifications It is unwise to reject customs and practices which have evolved through years of experience Those zealous persons who take no time off for relaxation exercise and sociability are making a grave mistake

Hygiene in the Tropics

Food and Drink Care in avoiding unsafe food and drink should soon be an automatic thing The desirability of a balanced diet is obvious But the homemaker will be faced with another problem Continued hot weather is likely to result in loss of appetite Much can be done to avoid this by making the home and the dining room in particular as cool and attractive as possible In a hot dry climate the house should be closed and darkened against the heat while the air is still cool in the morning The relief of coming into a relatively cool and shaded dwelling after the hot glare of midday is keenly appreciated

A daintily set table and a delicious meal well balanced and appetizing accompanied by cheerful conversation favor the survival of a good appetite in hot weather Highly spiced dishes are favorites in hot countries and taken in moderation are a useful addition to the diet Served too frequently they may stimulate a tendency to overeat and to indulge to excess in alcoholic beverages Such overindulgence may lead to a condition known as tropical liver changing a normal pleasant person into a jaundiced ill tempered dyspeptic

Although constipation may be a problem for some people in warm climates the opposite condition of diarrhea is more

likely to occur When diarrhea occurs in a healthy person un
accompanied by other symptoms it may be due to the pre
ponderance of bulky fibrous vegetables in tropical diets or to
laxative fruits such as figs In such cases cutting down of the
responsible food may be all that is needed to effect a cure
When there is pain a feeling of illness and fatigue discomfort
in the abdomen and perhaps bloody discharges a doctor
should be called These symptoms suggest intestinal infection

Water lost from the body in perspiration must be replaced
In hot weather thirst usually insures one s drinking enough
Some find it more convenient to drink freely in the cooler parts
of the day when drinks do not bring on so much discomfort
from perspiration and prickly heat

In hot weather the body loses salt as well as water If the
salt needed is not replaced the chemical processes of the body
are disturbed and there is danger of heat exhaustion heat
stroke or cramps One method of supplying this special need
of newcomers to the tropics is to add a teaspoonful of table
salt to each gallon of drinking water Others may prefer to
take it in tablet form or with their food It is a mistake to use
an excessive amount producing nausea

Those accustomed to living in the tropics usually get enough
salt in food without supplementing the supply Acclimated
persons lose less salt in perspiration than newcomers Those
engaged in heavy labor with ensuing excessive perspiration
will do well to use salt tablets with drinking water

Tea and coffee taken in moderation are mild and useful
stimulants for most people They are often the safest available
form of refreshment where unboiled water must not be drunk
Excessive indulgence in either can cause insomnia nervous
heart and other symptoms of nervousness however No per
manent injury results and the cutting down of the amount
taken is sufficient for recovery from effects of overstimulation

The harmful effects of alcohol on the body and the person
ality cannot be overemphasized Alcohol is pre-eminently a
narcotic dulling the sensibilities and not a stimulant as many
people think In regions where loneliness and boredom are
common it is dangerously easy to go to excess in seeking for

getfulness through alcohol or drugs with a resulting deteriora tion of health in body and mind which cannot accurately be estimated

Sleep and Relaxation Some individuals need more sleep than others The eight hours usually recommended may not be enough for some adults Newcomers to the tropics are likely to require more sleep The siesta is an important part of life in the tropics Women especially often tire nervously and they benefit from this break in the strain of the day The ability to relax mind and body during waking hours is a valuable asset Many find the reading of light fiction and detective stories a relief from concentration on their work

In the matter of *exercise* extremes in either direction are to be avoided Moderately strenuous setting up exercises done habitually in the cool of the morning provide an excellent way of keeping fit Outdoor exercise even if only a walk at sunset is strongly advised as a daily habit

The necessity for protecting oneself from the direct rays of the sun is obvious On the other hand many people in the tropics go to an extreme seeking to avoid the sun altogether A certain amount of *sunshine* or *skyshine* is indispensable In the early morning and late afternoon children should play outdoors The beneficial effect of the ultraviolet rays from the sun will help in preventing rickets and in building strong normal bones and teeth

Bathing indoors is an effective way of cooling off where heat is excessive Early or late in the day sea bathing is an excellent form of exercise improving the circulation and acting as a tonic to the skin It has been known to cure the persistent crops of boils which are so common at the end of a very hot season In fresh water one must investigate to avoid risk Pollution with sewage or in Egypt or North Africa the presence of snails infected with the fluke disease bilharzia renders streams un suitable for bathing purposes Water taken from places where bilharzia occurs can safely be used when it has stood for forty eight hours to insure death of parasites

A can of borated talcum powder in the bathroom is useful in cases of chafing or prickly heat Care should be taken to dry

the feet thoroughly after bathing Moisture between the toes encourages the development of athlete s foot Application of borated talcum powder between the toes is helpful as a preventive Towels should never be shared with other people since many skin diseases can be transmitted in that way

An *annual health examination* however well one may feel is to be recommended At the time of this examination the doctor can also administer whatever vaccines are due to be repeated

An annual *vacation* of a month or more expensive though it *may be in terms of time and money is in the long run a true* economy For some this holiday will provide the only opportunity for visits to the dentist or the oculist Mothers and children particularly need a respite from the hot weather

When circumstances make a journey to a cooler section impracticable some change of scene can usually be arranged A visit to friends in a near by place will provide social contacts and a release from familiar responsibilities Those who deprive themselves in this respect although their motive may be unselfish are likely to defeat their purpose by becoming a burden to their associates through poor health

It is often when one is physically tired and weak that emotions get out of hand There is need for understanding how to deal with emotion Says Dr Burlingame [1] Your emotions are your feelings and as such are a driving force which may lead you to great accomplishments You cannot promise your feelings but you can promise your behavior You feel what you feel know your own feelings never lie to your own self about them

Getting Along with Associates

Physical mental and what might be called spiritual health cannot be separated Each part of the individual affects the other parts With emotions accentuated by *isolation* and the absence of normal avenues of escape from jarring con

[1] Dr C Charles Burlingame *Rules for Mental Health* (privately printed in Hartford Conn)

tacts one can be made physically ill by misunderstanding jealousy and suspicion

Picture two naturally uncongenial persons closely associated in a lonely station One let us say is consciously troubled by the prospect of further friction between them His companion is irritable sarcastic given to saying things to make one feel inferior and small The first person is unhappy and miserable What is he to do?

With a trusted friend at hand he can talk the situation over unburden himself of his feelings of hurt and resentment and hear the viewpoint of an objective person If there is no such person he must discuss the matter with himself ask himself Do I really *want* to like this person have I *tried* to make him like me? He must examine himself and his habits that others may find annoying or exasperating

Am I too talkative too argumentative or too inquisitive? As an experienced worker am I bossy officious or domineering? As a newcomer have I begun to think that I know it all? Am I too sensitive do I read offensive meaning into remarks that are not intended to hurt? These are questions that one must ask oneself

He might then go on to a consideration of his associate To expect perfection is absurd Minor annoyances must be overlooked in the give and take of living together When the faults are greater it may help to try to understand their underlying cause Abnormal irritability and tension may be due to an over (or under) active thyroid gland In such a case without proper treatment the person can t help being the way he is

If you could look into the mind of your associate too you might find adequate reason for his behaviour—worries that are all unsuspected feelings of inferiority and insecurity A respect for his personality with sympathy and a genuine desire to like him on your part may do much toward clearing up the whole difficulty

There are times when a frank and open discussion can end an unpleasant situation For this tact and self-control are necessary A person who cannot trust himself to keep his temper

will do better to remain silent to attempt no such discussion Harsh criticism is likely to destroy any liking your associate may have for you

Psychology can offer no substitutes for patience and forgiveness You need live only one minute at a time And time will pass Later when you look back at this period of strain you will wonder why you found it so upsetting Realizing this will help you to be patient And forgive! You simply cannot afford *not* to forgive Holding a grudge will poison all your thinking and may even make you physically ill

Make your own life as pleasant for yourself as you can Avoid unnecessary continued intimacy with an uncongenial person Find agreeable companions and have a room to yourself where you can be alone at times Take time for rest and recreation every day Even in those places where human companionship is unavailable one can relax with hobbies—photography music sketching or making collections of various sorts

With pets in the tropics one must exercise a certain amount of caution Rabies in some parts of India is quite common Dogs should be inoculated against it Ringworm and some other diseases which infect dogs and cats can be transmitted to human beings as well

SUGGESTED READING

Victor Heiser M D *You re the Doctor* W W Norton & Company Inc New York 1939
Harold S Diehl M D *Healthful Living* McGraw Hill Book Company Inc New York 1931
Edward M Dodd M D *The Health of Our Missions* Board of Foreign Missions of the Presbyterian Church New York 1918
George H Preston M D *The Substance of Mental Health* Rinehart & Company Inc New York 1943
Smiley Blanton and Norman Vincent Peale *Faith Is the Answer* Abingdon Cokesbury Press Nashville Tenn 1950

WOMEN AND CHILDREN IN THE TROPICS

THE DAY when a country with a hot climate was automatically marked down as no place for a woman has passed There is an increasing demand for women workers in many fields There is a need for teachers executives secretaries social workers doctors nurses and others with special qualifications

The happy and well adjusted wife accompanying her hus band to a distant land can glory in her vocation but it is a grave injustice to take a bride to a life and a country for which she is not fitted Efficient wifehood under the relatively more exacting conditions in the tropics requires more than usual de votion and ability

The married woman makes a home for her husband and children in addition her residence should be a center of social life for the community In conservative Muslim countries where unchaperoned companionship between men and women is likely to be misunderstood the home of a married couple provides a place where unmarried associates can enjoy conversation and companionship

Although she will not as a rule have to do all of her own work a woman will find that any experience she may have in housekeeping is useful Even with the uncommon blessing of dependable and well trained servants she will have much to do in managing the household This will require knowledge of local conditions as well as patience and a measure of diplomacy

Upon arrival the newcomer quickly becomes conscious of one outstanding fact—she cannot speak the language of the

country Even *to* care *for her own family* one must acquire some form of kitchen dialect For many this will not be enough They will employ a teacher or attend a school and learn to speak and read and write correctly Such a knowledge is amazingly useful and rewarding

Children in the Tropics Normal husbands and wives very naturally want children but in spite of such a desire they might hesitate to bring children into the world that is the tropics They may well hesitate unless they are prepared to *give themselves with all their resources to the project of being* parents One must be playmate parent teacher and general mentor Nurses native to the country devoted though they may be are unlikely to teach the child his Now I lay me down to sleep or to instruct him in the fundamentals of baseball The child s thinking must not be allowed to remain at the nurse s level The child must learn to speak his nation s language without accent It is to his parents and their friends that he must look for these things

In remoter sections the parents chief problem is that of providing educational facilities for the children At one time it was a common practice to send the little ones home to boarding school when they reached school age Relatives or friends could usually be found to care for them during vacations Now *however parents are finding means of keeping their children* with or *near* them for much longer periods of time In some cases a mother is the self appointed teacher sometimes with the aid of the Calvert or Winnetka systems and children s encyclopedias [1]

In some cases a mother with teacher s training will enjoy forming a small class of her own children and those of friends For larger numbers of children boarding schools have been set up in hill stations and seaside resorts where the climate is good In some places education is possible even through college years although many parents prefer transferring their children to schools in their native land before they enter college

Child Health in the Tropics Is a child brought up in the

[1] For information write the Calvert School Baltimore Maryland and Winnetka School Winnetka Illinois

tropics handicapped in respect to health? The answer must depend on a number of factors and the first of these is the parents themselves Lacking statistics for comparing the number of casualties among children of foreigners in the tropics with those among children of the same nationality brought up in their native land we can best refer to the report of Dr Lennox on the results of his study of the children of one foreign group in China In families where at least one parent had received education in medicine or nursing the child death rate was only about two thirds of that in families where there was no such training It is then only reasonable to infer that *the physical welfare of children in hot climates is proportionate to their parent s skill in taking care of them*

There is of course the factor of varying climates and disease risks Some places are associated with greater risks than are others Angola in western Africa was long considered as almost certainly fatal for foreign children remaining there beyond the age of infancy Within recent years however as a result of efficient methods of disease prevention and increased knowledge regarding nutrition Angola has been found safe for children

The Child s Nurse To help in the care of small children a nurse from among the people of the country is usually available Some of these have had experience in other families and are loyal and trustworthy in every respect In other places the mother must choose a clean healthy woman or girl and train her

A nurse can be invaluable in a hot climate where the mother needs some degree of freedom for health s sake After the baby is bathed and fed the nurse can at least wheel him out in his carriage for a longer time than the mother can spare from her other duties She can watch over the older children in their play do all the routine work of keeping the nursery clean and act as baby sitter when the mother and father go out to dinner in the evening

It is important that anyone caring for children should be healthy An examination including if possible X ray of the chest for tuberculosis blood tests for syphilis and a stool ex

amination for dysentery germs should be made The doctor should certify that the nurse is free from venereal diseases of all kinds that she does not have trachoma or other contagious diseases of the eyes or skin

To insure the cleanliness of servants having close contact with the family it is a good plan to provide new clothing to be worn only at work Inspection of the hair for vermin with suitable treatment when needed is a very practical concern It will be a great advantage if a bathroom can be set apart where the nurse can take a bath on coming to work

The nurse must always be carefully supervised Take nothing for granted Such servants often come from a society where it is usual to give opium to babies to keep them from crying They have little understanding of hygiene as we know it regarding flies as a minor irritation rather than as possible transmitters of eye disease or intestinal infections The well trained nurse may be exemplary in all these respects but even so she must not be left entirely to her own devices

The child s nurse is usually sincerely devoted to the children under her care and they often love her fondly in return Unfortunately her devotion may have some unfortunate influence on little folk She may through mistaken adoration assume the attitude of slave and encourage the little master or mistress to give orders which should be permitted only to parents A child becoming imperious and striking his nurse when she fails to please is not to be tolerated An attitude of respectful consideration on the part of the children toward all the servants should be instilled in them very early

Boys and girls need work just as adults do Daily chores are essential and may not be easy to invent in a household where servants do the work For play swings and seesaws sand piles and play houses are easy to build Simple improvised toys are wonderful for children

Love is the sunshine in which little lives unfold Impersonal care however efficient cannot take its place The security of family life individual attention and discipline—which is a manifestation of love and firm but never harsh—are necessary if the child is to thrive

[7]

A HOME IN THE TROPICS

AS A RULE the traveler finds his future residence already prepared by those who have preceded him An overcritical attitude will avail him nothing Such innovations as he might like to make may be entirely out of the question or impracticable Later he may have an opportunity to build his own dream house From a study of considerations which are important in building a house he may find suggestions for improving the place in which he lives

In the selection of a home site there are several factors to consider The most obvious of these is perhaps that of comfort The prospective builder will consider prevailing winds to have the full benefit of cooling breezes The health aspects of the site must be given careful consideration too Natural drainage is to be noted Standing water or swampy ground provides breeding places for mosquitoes Therefore a high spot on a slope is desirable Proximity of villages with high malaria rates must be investigated Infected mosquitoes can fly a mile

As a foundation sand makes a better base than clay which tends to undergo changes with cracking walls as a result The location of ground water must be ascertained For this a depth of six to eight feet in all seasons is best The availability of good abundant drinking water is a primary need Surface water—in streams ponds and the like—may almost always be assumed to be polluted Ground water—that which is brought to the surface in springs and wells—may be heavily infected however clear and sparkling it may appear When testing of the water by means of specimens sent to a public health lab-

oratory is impossible it is safer to take it for granted that the water requires boiling before use

Where wells whether shallow or artesian are to be drilled an impervious cover of concrete as well as a casing of the same material should be arranged The casing should rise at least *eighteen inches above the ground and go as far as possible* down into the well preferably one foot below the lowest ground water level

Rain water to be used for drinking purposes should be caught on a clean waterproof surface In houses with a central court the roof is used for this purpose with a funnel of sail cloth attached to catch the overflow All cisterns or tanks for water should be watertight and covered with a direct overflow *outside Screen all openings to prevent mosquitoes breeding*

Underbrush should be cleared away from about the house to a distance of at least ten feet since it provides a place of concealment for snakes and mosquitoes Vines growing on the house give shelter to vermin

Screening the house and especially the bedrooms is very important and doors and windows should be constructed with this in view All openings should be arranged so as to provide the maximum circulation of air The beauties and advantages of local styles of architecture should not be lightly ignored

Building materials will vary according to local resources Thick adobe walls popular in many places *exclude the heat* effectively Cement however is coming into more general use because it is proof against rats and termites Also its light color absorbs little heat When cement is used walls should extend about two feet below the surface of the ground All openings of course should be screened Rats are particularly dangerous in regions where epidemics of plague occur

Termites are a common and constant menace in tropical parts Where cement *is not* used for construction other measures can be taken for protection of building materials used A horizontal sheet of galvanized iron with edges turned down *can be incorporated into foundations or posts on* which the building rests The steps to a house need not actually touch the building and termites will not be able to cross the gap The kind of wood most resistant to termites should be selected

A chemical wash of crude creosote plymol or solignum used as a coating on wooden parts is another means of protection Piles of timber should not be left in the vicinity of houses

A mixture which is effective against white ants is given by Stitt Two pounds of dry commercial arsenic is mixed with two pounds of dry commercial caustic soda Add two gallons of water slowly since the mixing produces much heat and may cause the mixture to boil over The resulting paste is boiled for a few minutes with continued stirring and then cooled and strained through clean hessian (hemp) or similar material It can then be bottled labeled *POISON* and stored for use

This solution may be applied to surfaces of floors walls or furniture but it is best to test it before extensive use Wood that has already been attacked by the ants can be treated by applying the solution to the ant tunnels and surrounding wood or by boring auger holes diagonally downward and filling the holes with the liquid

In some tropical communities air conditioning is available The difference between indoor and outdoor temperature should not be allowed to exceed 10 to 15 degrees Insulation against heat can be provided by including aluminum foil in the walls The punkah a long fan of straw matting slung from the ceiling has long been used in India A swaying motion is given to the fan by means of a rope pulled by a servant on the veranda Electric fans have been introduced in many places

The khus khus tattie inserted in windows and doors consists of a layer of fiber or roots between two sheets of metal screening The fiber is kept wet so that air coming into the room is cooled by evaporation of the water

For warmth in the cool season fireplaces may help

Flat roofs of clay surrounded by a parapet are common in some countries and are often used for sleeping purposes in hot weather These are likely to leak unless they are repaired before the rainy season Where rain is excessive a sloping roof is needed Thatched roofs harbor vermin

Sanitary toilet facilities must be provided not only for members of the family but for those employed in the house While modern toilet facilities are becoming increasingly common in many places the system of placing individual commodes in

bathrooms is still used With efficient scavenger service the pails are emptied and washed several times during each day

Sanitary privies and bore hole latrines are used in some places The latter is a device suitable for use over a limited period of time and in locations where the ground water is not too near the surface Its construction is inexpensive and when one hole has been filled another can be drilled The apparatus can be carried in a car for touring An augur fourteen to sixteen inches in diameter is used to bore a hole eight to twenty feet deep A perforated slab made to fit over the hole constitutes the floor of the toilet All privies and latrines should be located at least fifty feet away from the residence or any well

Better than either the commode system or the use of privies is the practice of having toilets empty into a septic tank In it the contents are changed and rendered harmless and colorless by bacteria favored by darkness stillness and the absence of air A few shovelfuls of horse manure added now and then will prevent odor and clogging When the process of change is complete the resulting fluid is suitable for use in irrigation

Exposed garbage not only favors the breeding of flies but also attracts rats Bottles and tin cans unless crushed and flattened collect rain water in which mosquitoes breed Refuse may be either burned or buried Composting all refuse by burying it twelve to eighteen inches beneath the surface of the ground will provide in years to come a very fertile spot for gardening

J Balfour Kirk *A Manual of Sanitation* Baillière Tindall and Cox London

For sale by Superintendent of Documents Washington D C.

The Sanitary Privy Supp 108 Public Health Report 5¢

Sewage Disposal for Suburban and Country Homes Supp 58 Public Health Report 10¢

Sewage and Garbage Disposal on the Farm Farmers Bulletin 1950 10¢

Obtainable from Virginia State Dept of Health Richmond

Septic Tanks for Suburban and Country Homes Built in Place Concrete Septic Tanks (1941)

The Sanitary Pit Privy (1941)

HOUSEHOLD PRECAUTIONS

THE IMPORTANCE of safe drinking water cannot be overempha sized Except where the municipal supply is adequately chlori nated all water to be used for drinking brushing the teeth or for finger bowls should be boiled for five minutes A large pot or kettle with a cover makes a good container The ladle used for removing the contents should be sterilized and allowed to stand in the pot One cannot always depend on servants to attend to this

Unclean water requires filtering *before* boiling not after And filtering alone does not make water safe for drinking The Berkfield filter has a capacity usually sufficient for household use It should be cleaned twice a week and since the cylinders are rather fragile a soft brush is used to remove the film which collects on them When the cylinders are clean they are placed in cold water which is brought slowly to a boil and after 15 minutes boiling allowed to stand for gradual cooling

When filtration is impracticable the sediment in water can be settled by the addition of a pinch of alum After the alum has acted for 15 or 20 minutes the clear water may be poured off for boiling leaving the sediment in the bottom of the con tainer For large quantities of muddy water ⅓ grain of alum is needed for each gallon If the water is soft this amount of alum will render it acid In such a case ⅓ grain of washing soda should be added to the water for each grain of alum used

Water should be not only safe and clear but cool Unless ice is known to be made of safe water it should not be added to

drinks Bottles of boiled water can be placed around a block of ice however A device common in the tropics is that of keeping drinking water in a porous earthen jar placed in the breeze to promote evaporation After a jar is washed and scalded when new a handful of salt thrown into it and washed out after a few hours will increase its cooling power The mouth of the jar should of course be covered to protect it from dust

Water may be made safe for drinking by the addition of certain chemicals *Chlorinated lime* is commonly used for this purpose One pound of good grade chlorinated lime (dry) is mixed with a half gallon of water to make a stock solution One teaspoonful of this solution is added to each gallon of drinking water After fifteen minutes provided there is a slight taste or odor of chlorine the water may be used

For disinfecting a well of ordinary size dissolve 2 glassfuls of dry chloride of lime in a pail of water strain through muslin and pour into the well

Halazone tablets containing chlorine are useful while one is traveling Since these tablets deteriorate rapidly on exposure they should be bottled in quantities of not more than 100 One tablet is usually sufficient for a quart or liter of water Hard tablets should be crushed in a piece of paper before use and water should stand for half an hour after being stirred or shaken in a bottle An odor of chlorine is an indication that enough of the chemical has been added

Tablets of *sodium bisulphate* are marketed for use of travelers For one pint of water 15 grains is required Vessels of aluminum are suitable for this solution but not those of copper or iron It does not keep well and should be freshly made

One drop of 7 5 per cent *tincture of iodine* will sterilize a quart of water Water should stand for 15 minutes before use

Potassium permanganate is useful against cholera germs but is *not* a reliable antiseptic for killing dysentery germs On the whole chlorine is a more reliable agent even for cholera germs

Boiling or Pasteurization of Milk Fresh milk from whatever animal can seldom be guaranteed to be safe without boil

ing or pasteurization Even with careful handling of the animal by a healthy individual with examination of livestock to insure against undulant (Malta) fever and tuberculosis there is still a chance that milk may be contaminated by the vessel in which it is collected or the hands of the milker The slight advantages of raw milk are far outweighed by its disadvantages

Boiling milk 1 to 3 minutes in an open saucepan with stirring is the simplest method of killing disease germs When using a double boiler one should extend the time to 10 or 20 minutes after water in the bottom pan has begun to boil Pasteurization consists in heating milk or cream to a temperature of 145 F and keeping it at that point for 30 minutes In *flash pasteurization* the milk is brought to a boil taken immediately from the fire and the pan surrounded by ice or very cold water

Butter and cheese made of unsafe milk can transmit disease When making these products in the home one can pasteurize the milk or cream used Doubtfully safe butter and cheese can be pasteurized in the top of a double boiler They will melt but solidify again on cooling In many places reliable brands of canned butter are available Canned sterilized and dried milk are very useful in the tropics Relatively small cans are preferable since the contents of larger sizes may spoil before they are used

Food Safety A large proportion of the diseases common in the tropics are due to contamination of food or drink with disease germs which can be destroyed by heat In most cases the usual cooking time is sufficient for foods but pork must be cooked 30 minutes for every pound of weight to guard against trichinosis This procedure will also protect one from pork tape worm Where beef tape worm occurs beef must also be thoroughly cooked The same applies to fish crayfish and crabs which in some localities are frequently infected with certain fluke diseases

Perishable foods such as meat and sea food must be purchased very fresh and preferably in amounts to be eaten during one meal They should be cooked and eaten without delay

Foods of the custard type—cream puffs and ice cream—often give rise to epidemics of food poisoning since germs from hands or throats of food handlers multiply rapidly in them Leftovers must not be allowed to accumulate and food should not be placed in direct contact with ice It must be understood that freezing does *not* kill germs it merely delays their action

Canned foods are valuable food resources in the tropics. When cans bulge or emit a hollow sound on being tapped, there is a possibility of spoilage More than two solder marks on the can indicate that it has been opened and resealed Whenever the contents of tins seem abnormal in color consistency odor or taste it is safer to discard them Although germs in the contents would be destroyed by boiling poisonous substances are not so removed

The preparation of raw fruits and vegetables requires the housekeeper s personal attention especially where dysentery is a common complaint Only when it is certain that human excreta have not been used as fertilizer can one depend on the usual washing and scrubbing to make these foods safe Washing fruits and salad vegetables with potassium permanganate is *not* sufficient since this does not destroy germs of dysentery An effective method worked out by doctors in China is to dip each piece in briskly boiling water for a period of 10 seconds. For fruits with rough or irregular surfaces 20 seconds is recommended Most fruits will not be much changed by this process Lettuce will be wilted but usable after chilling

Melons as we have mentioned may have been made to absorb unsafe water to increase their weight Water has at times been injected into persimmons by means of a hypodermic syringe for the same purpose Immersing them in boiling water even for 20 seconds would not make such fruits safe of course.

Cleanliness in the kitchen is essential Unhealthy or unclean food handlers are a definite menace A cook harboring dysentery germs can infect the whole household through his fingers When possible the stools of all food handlers should be examined twice a year Those in whom infection is discovered should be suspended from all work associated with

food until pronounced cured by a doctor Train all servants to wash their hands carefully before touching food Provide soap and water for that purpose When dishes have been washed the most sanitary practice is to pour boiling water over them and allow them to dry by evaporation In any case dirty dish towels are not to be tolerated

Protection from Insects Flies are so common in hot countries that the natives adopt a philosophic attitude toward them Some Arabs for example have a tradition that while flies carry harm on one wing they carry benefit on the other

Modern science is not so sanguine about them The house fly we find breeds by preference in human excreta and it can fly as far as eleven miles in four days Before eating food it deposits any germs it may have eaten This undoubtedly explains many cases of dysentery typhoid fever and other intestinal diseases

The potential danger of houseflies needs to be understood at the same time too much thinking about them may lead to harmful worry which accomplishes nothing helpful A sensible and practical attitude combined with habitual carefulness is infinitely better The use of screening the spraying every two or three months with DDT of walls and other places where flies light daily use of the spray gun and the fly swatter and careful training of servants do much to reduce the hazards Cloth covers like doilies of cotton net weighted with a bead fringe are often used for covering the milk pitcher honey jar and other such dishes

Mosquitoes carry some of the most dreaded of tropical diseases including malaria and yellow fever When metal screening for the home is unavailable cotton netting can be tacked over the windows and draped to curtain the doors Standing water about the house should be eliminated Water in the saucers of flower pots in empty coconut shells tin cans hollow trees hoof prints and the cupped leaves of trees and plants may provide a breeding place for some varieties Roof gutters must be kept clear during the rainy season to prevent water from collecting on the roof

Every member of the family should have his own bed net

Cotton netting with a mesh of sixteen or eighteen threads to the inch should be used for these In one common type the netting forms a cubicle about the bed The rectangular top exactly the size of the mattress has tapes sewn to its corners for attachment to posts at the corners of the bedstead The four walls of netting extending about four feet above the mattress may have a foot of muslin or canvas at the bottom to tuck under the mattress Some people prefer to have canvas extend a foot above the mattress to prevent mosquitoes from biting the sleeper if he lies against the netting

Constant watchfulness is needed for discovery and repair of holes in bed nets as is a morning and evening inspection and spraying with insecticide in case mosquitoes have been imprisoned Nets are folded over the top of the posts in the morning and tucked in all around the mattress at about sundown In going to bed one pulls out the margin just enough to get inside then quickly tucks it in again Provision of a flap like a door *is not* advisable

Malarial mosquitoes which bite only at night can often be swatted while resting on walls in the daytime DDT sprayed on walls acts slowly but has a lasting effect It is said that electric lights or storm lanterns placed under dinner tables during meals *prevent mosquitoes from coming to* bite the ankles of diners The expedient of burning punk or incense is well known too

DDT (dichlorodiphenyl trichloroethane!) is a recent and effective insecticide Insoluble in water it can be used as a *solution in oil as an emulsion diluted* with water or in combination with a dusting powder Its outstanding characteristic is its *prolonged* poisonous effect It does not act so quickly as Flit

DDT is practically useless unless properly applied The *average user should buy prepared products* Such preparations indicate on the label the percentage of DDT and have explicit directions for use Emulsions are best for general use since they can be stored in concentrated form and diluted with water as needed They dry more quickly than kerosene solutions *create less fire hazard have little odor* and leave no objection

able stain when lightly applied They should not however be used on varnished surfaces

Oil solutions and emulsions may be painted on a surface or used as a spray Painting of door and window screens is eco nomical and effective For penetrating cracks DDT solution or emulsion can be squirted with an oil can

Used as a spray indoors a 5 per cent solution or emulsion of DDT is toxic to anopheles mosquitoes for several months as well as houseflies Outside even a 1/ per cent DDT emulsion or solution applied to fly breeding places will kill the flies as they emerge for about three weeks In the home care must be taken that flies killed by the insecticide do not fall into milk or food

Two ounces of talcum powder containing 10 per cent DDT will control body lice on the individual Garments should be dusted most carefully about the seams After such treatment clothing may be washed once and still remain lice free For bedbugs a 5 per cent emulsion or solution used as a spray on infested beds and walls and floors about beds will give com plete protection for six months at least Bugs may remain alive for forty eight hours after the spraying and for quick results a spray containing pyrethrum may be used at the same time

A 5 per cent or 10 per cent emulsion of DDT applied to walls ceiling and floors with close attention given to cracks and dark corners is partially effective against cockroaches A week after the spraying dusting powder containing 10 per cent DDT should be applied to cracks and crevices Spraying and dusting will need to be repeated at regular intervals since the insecticide has little or no toxic effects on the eggs of insects

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Spiders crickets carpet beetles ants centipedes moths silverfish and other household pests are killed by DDT Ex

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pert opinion should be obtained however before using it to eliminate agricultural pests lest plant tissue be harmed and beneficial insects and parasites be destroyed

DDT can be handled without danger provided there is no constant or excessive exposure of the skin to *oil solutions* The emulsions or kerosene solutions should never be allowed to remain on the skin or saturate clothing After using such preparations wash the hands with soap and water and when work is completed a soapy bath should be taken For occa sional spraying work wear old clothes and remove them when the work is done For regular residual spraying a chemical cartridge respirator goggles rubber gloves and heavy clothes and hat should be worn If skin or eyes become inflamed from DDT sprays treat affected parts with a warm solution of boric acid until a doctor can be consulted or relief is obtained When *DDT* is *swallowed* give mustard water (1 *tablespoonful* of powdered mustard to a glass of warm water) to induce vomit ing A physician should be called

Probably the best insect repellent for keeping off mosqui toes gnats flies etc is that known as 6–2–2 mixture *It is effec tive against a wide variety of insects* A half teaspoonful is poured in the palm of the hand one then rubs the hands to gether and applies a thin layer to the face neck ears hands and wrists *It may also be sprayed or rubbed on clothing* [1]

During protracted rainy seasons leather goods often become moldy and need to be wiped dry every day Contents of clothes closets should be hung out in the sunshine at every opportu nity during such a season An electric bulb burning in a closet helps to prevent mold One kind of fungus growth causes stains resembling iron rust on bed and table linen and clothing Sprinkling formaldehyde solution on the fabrics or placing small bags of formaldehyde on shelves where such articles are stored will destroy these air borne fungi

[1] For further information see Miscellaneous Publication No 606 U.S Department of Agriculture entitled *DDT and Other Insecticides and Repellents*

[9]

SERVANTS IN THE TROPICS

SOME PERSONS come to the tropics fully intending to manage their homes without the help of servants It is wise to familiarize oneself with local conditions before too fully resolving upon such a course of action

In parts of India and along the Persian Gulf the usual kitchen is a crude structure separate from the house Water is carried from the well The kitchen stove built of clay is designed to burn wood or charcoal The oven placed on the stove when in use resembles a huge pillbox with a fire burning on the cover

Even providing that one is willing to defy custom to the extent of making the daily marketing trip to the food bazaar in company with the neighbors cooks the exertion in the heat of the day is exhausting One is at a disadvantage in the customary bargaining for food A hired cook can get better values at a much lower price Even when he takes a small commission for himself the employer is still saving money on the transaction as a rule

The caste system in India permits the individual servant to do only his own particular kind of work The resultant multiplicity of helpers is reflected in neighboring countries among them Arabia where the caste system does not prevail One manservant will cook another washes clothes another carries water while still another does the scavenging work necessitated by the commode system in bathrooms

The dhobi who brings back the laundry looking so clean and

neat can usually be shared with other families The same is true of the man who does the bathroom work as well as the water carrier But in most homes the cook s service is supplemented by another servant who serves the food and keeps the house in order Where there are children employment of a nurse is taken for granted

The expense involved in the employment of so many servants is not nearly so terrifying as it might be thought Wages in tropical countries are very low It may be less expensive to live in this way in a rural part of the country than to rent an apartment with modern conveniences in a large city where fewer servants are the rule

One cannot live in the tropics for any length of time without realizing how much established custom governs the life of everyone there To some extent this is true elsewhere but in the tropics it seems that what is has always been and must forever be A man will sooner give up his job than do a thing that is not customarily done by the people of his caste In matters related to caste and religion one can only bow to necessity

This state of affairs is not always a disadvantage to the employer Fair and considerate employers have preceded him and he need only fit into the established pattern He can make innovations of course which are pleasing to his helpers such as allowing them longer leaves of absence during religious holidays But in doing so he must realize that he will find it difficult to change what becomes so easily an established precedent It is well to confer with friends and neighbors before initiating a change

Life is certainly made easier and pleasanter when one has servants The poor people about one are given needed employment and one is given an opportunity to concentrate more fully on his own work But with these advantages come certain responsibilities The importance of selecting healthy food handlers and nurses has been stressed elsewhere There are other factors too that must be considered

The management and training of helpers with a background so foreign to the employer s own experience require special

qualifications on his part Dr J G Vaughan contributes the following advice on the subject

For the first year it is well to live in a home entirely or at least partly managed by one who knows the people and their language The entire housekeeping ménage will probably be quite different from anything experienced in the past the foods and their seasons the market prices the method of preparation the kitchen and housekeeping equipment and technique the temper and frailties of servants are all matters well worth learning from one who has had much experience Be patient and take time to learn these important lessons Servants are great blessings and can bring comfort and order to the home and relieve the mistress of the home of all the drudgery But first know well yourself the job you want your servants to do and then learn the frailties and foibles as well as the strength and capacity of your servants The wise woman is she who is mistress of her own kitchen and by her intelligent understanding of this basic center of the family health commands the respect and obedient cooperation of her servants.

But these helpers so necessary in the tropics are sometimes the most vexing problem that the newcomer has to face Usually with the help of older workers in your vicinity you will find one or two servants who have some skill and experience in the work of the foreigner s home May it be your good fortune to find one of those jewels who by their skill and loyalty carry faithfully their important responsibilities But it is quite possible you will not be so fortunate Unless trained for many years in foreign households the native servant has an all too inadequate understanding of hygiene and sanitation and perhaps of simple cleanliness as we know it In countries where the various dysenteric diseases and other microbic infections are ever present the wise and skillful mistress will be eternally vigilant in her supervision Even in such a simple process as boiling milk and drinking water you must be sure from constant observance of his technique that your cook can be trusted Your skill or lack of it in securing efficient service in respect to these two items namely sterilization of water and milk may mean the difference between sickness and health for the members of your household They [your servants] come from a background of poverty as a rule and their wages are very paltry judged by Western standards Careless supervision encourages dishonesty and theft Usually they sense a moral code of their own that makes for great faithfulness and trustworthiness when specifically assigned re

sponsibility for safeguarding the property of their mistress But it must be mutually understood by both mistress and servant that an inventory has been made and is being constantly checked Skill in doing this without loss of face for the servant and yet letting him know that you are watching the faithfulness with which he discharges his stewardship will encourage his honesty and loyalty Many a servant of honest intentions is made dishonest by a careless and shiftless mistress

It is indeed true that some good household helpers are spoiled by their employers shortcomings A good beginning is very important to a successful relationship Servants are watching to see what sort of a person this new master or mistress will be Be sure to get a reputation from the beginning for being particular An impression of laxness cannot later be changed without a great deal of unpleasantness Never pass over even a small neglect of duty Quietly without any display of temper insist on obedience in every detail Whether supplies are to be kept under lock and key will depend upon circumstances In some places this is a necessary precaution Be considerate and fair in your dealings with servants Do not be afraid to show an interest in their affairs and the welfare of their families But never be undignified or too talkative about trivial affairs Otherwise what is meant for a democratic spirit is likely to be misunderstood as weakness

The employment of servants is far from being an unmixed luxury To take unpromising material and produce an efficient and reliable helper may be an exacting task But the employer who can teach those who serve him to be valuable assistants well trained and unspoiled makes an important contribution to his own household to future employers and also to the servant himself

[10]

FOOD FOR HEALTH

WHAT DID YOU have to eat over there? Of all the questions asked of people returning from the tropics this is probably the most frequent Those who have stayed at home expect to find great changes in their friends who have lived in far off parts of the world They may be surprised to find them normal in dividuals who have apparently not suffered from undernour ishment

When trying to answer a question of this sort a person recalls many things Sometimes his mouth waters at the thought of juicy mangoes succulent fresh figs and dates newly ripened on the date palm luscious fruit which slip out of the skin like a concord grape Maybe he thinks with longing of the water chestnuts bean sprouts and Chinese cabbage so well cooked in Chinese food of the flavor of chillies in Mexican dishes or of spicy curries enjoyed in India To prove how enjoyable tropical foods can be he may invite his friends to some local restaurant where his favorite exotic dishes are served

The majority of travelers will find at their journey s end the possibility of getting most of the foods to which they are ac customed When necessary native resources can be supple mented by canned goods either available locally or ordered at intervals from a distance Where agriculture is possible one can have a garden Needed products which are unknown in the community can be introduced by the newcomer conscious of food values Not only for his own sake but for the benefit of the native population the foreigner has often imported

fruit trees of the citrus and other varieties and grown tomatoes and other important vegetables from seed The grain used in some places may not be so rich in nutriment as other varieties such as rice wheat or oats which could be raised Introducing the red palm makes available the only kind of vegetable oil known to contain Vitamin A Soybeans and peanuts can fill a great need where animal proteins are scarce and too expensive for use by the poor Certain green vegetables can supply the need for calcium where there is little or no milk to furnish calcium for the masses The introduction of superior breeds of livestock is an important contribution in certain localities

Persons who plan to live in a foreign land have a special need for knowing just what are the important kinds of foods Those who will bear the responsibility for their own health and that of others should whenever possible avail themselves of a course in nutrition or at least provide themselves with literature on the subject of food [1]

A GUIDE FOR AN ADEQUATE DAILY DIET FOR THE FAMILY [2]

MILK

Recommended amounts

1 quart for each child and each prospective mother
1½ quarts for each nursing mother
3 or 4 cups for each adult

Minimum amounts

3 or 4 cups for each child
1 quart for each prospective mother
1½ quarts for each nursing mother
or 3 cups for each adult

FRUITS

1 serving of fresh citrus fruit such as orange or grapefruit or a serving of tomatoes raw or canned
1 serving of other fruit fresh or dried cooked or raw

[1] See suggested readings at the end of the chapter

[2] Taken from *Recommended Dietary Allowance* National Research Council Reprint and Circular Series Number 115 January 1943 Copies of this pamphlet or later editions may be obtained without charge on request from the Food and Nutrition Board National Research Council 2101 Constitution Avenue Washington 25 D C

VEGETABLES

1 or more servings of potato

2 or more servings of other vegetables at least one of which should be of the green or yellow varieties

EGGS

Recommended amount 1 egg for each child and each adult (occasionally 2 eggs for adults)

Minimum amount 3 or 4 eggs a week for each person

LEAN MEAT FISH OR OTHER SEA FOOD AND POULTRY

Recommended amount 1 or sometimes 2 servings daily

Minimum amounts

1 serving on at least 5 days a week

On days when meat is not served dried beans dried peas peanut butter nuts cheese or eggs may be substituted

CEREALS AND BREADS (*whole grain or enriched with thiamin*)

Cereal 1 serving daily

Bread 1 serving at each meal (more bread may need to be eaten if the requirement for energy is unusual or if for some reason other foods are limited)

FATS AND SUGARS

Butter 1 tablespoonful (or the same amount of oleomargarine to which vitamin A has been added)

Sugars and fats other than butter as needed for energy

(It is taken for granted that salt will be eaten with food)

As an alternative plan the National Research Council offers the following list of foods more easily obtainable in certain localities where less lean meat and milk are available

Turnip greens	1 cup
Sweet potatoes	3 potatoes
Peanuts	20 nuts
Beans or cowpeas	1½ ounces
Tomatoes	1 cup
Corn meal	5 ounces
Enriched flour	3 or 4 ounces
Milk (fresh evaporated or dried)	½ quart
Lean pork	small serving 3 or 4 times a week

Molasses fat etc to complete the meals

Most readers can make available for themselves and their families all the foods which have been suggested for an adequate diet Where no animal milk can be obtained even for infant feeding soybean or peanut milk can sometimes be prepared according to the recipes given in appendix A If other substitutions are required as in the use of other fruits and vegetables instead of citrus fruits and tomatoes comparative values can be estimated by use of tables found in appendix A

FOOD ELEMENTS

WHAT ARE THE classes of foods to be considered in planning a diet? They are carbohydrates (starches and sugars) fats and oils of both animal and vegetable origin proteins also classified as to their animal or vegetable source minerals and vitamins Water is also essential as well as a certain amount of roughage which is furnished by the husks and fibers of foods This gives bulk to diet and prevents constipation The superabundance of such fibrous material in some tropical menus may cause diarrhea in the foreigner accustomed to a smoother diet

Carbohydrates

Bread cereals starchy vegetables like potatoes sweet vegetables fruits sugar and syrups come in this classification Carbohydrates are the cheapest source of energy and are usually eaten in large amounts in tropical countries but varieties associated with important minerals and vitamins are sometimes not available

Fats

These with carbohydrates and proteins constitute the *energy producing food materials* Fats produce twice as much energy and heat as do corresponding weights of carbohydrate or protein foods A certain amount of fat is needed everywhere not only to contribute calories for energy especially for the needs of very active persons but also to make food palatable For energy and palatability animal fats (including the fat of meat and lard and vegetable fats like coconut olive peanut

and cottonseed oil) are useful Cream butter some fish oils and the oil of the red palm also contribute vitamin A

Proteins

Besides producing energy proteins are of great importance as *building foods* In many cases the need for supplying protein of good quality is the most difficult problem facing people with low income Not all proteins are equally valuable Pre-eminent among the most useful or complete proteins are those of *animal* origin meat fowl fish and other sea foods eggs milk and cheese[3] Unfortunately animal proteins are the most expensive of foods and often out of reach for the poor Also vegetarians as in the case of the Hindu people are prohibited from consuming any animal foods excepting milk and cheese and in some instances eggs

Tiny dried fish furnish the only animal protein in some communities while in other places people prevent ill effects from deficiency of animal protein by eating locusts grasshoppers caterpillars grubs found in the pith of palm trees and the eggs of termites

Of the *vegetable* foods soybeans and peanuts contain complete proteins closely approximating in value those from animal sources Soybeans are much used in China Peanuts roasted and eaten plain are suitable for adults For children they are a valuable food when made into peanut butter To make this roasted peanuts (the British call them monkey nuts) are put six to eight times through a meat grinder using a fine blade Nothing is added except salt to taste

Other vegetable proteins such as those contained in various kinds of beans peas lentils nuts and cereals (including oat meal rice and wheat) are incomplete and for this reason need to be supplemented either by one another or by animal protein There is evidence that it is not satisfactory to have one of the incomplete proteins at one meal and another at a

[3] To be complete a protein must contain all the essential amino acids, whereas an incomplete protein may contain all but one An animal body cannot thrive if even one of the amino acids (i e building stones" of proteins) is missing

[4] Unfertilized vegetable eggs may be permitted to Hindus

different meal because the amino acids of one food will be burned by the body before those which might supplement them from another food are eaten When reliance must be placed to a great extent on vegetable protein the practice of serving two or more sources of vegetable protein together is a good one Grinding cereals and legumes together for porridge or bread or serving them together at one meal makes use of whatever supplementary value the two sources may have for one another The combination of milk with cereal is very good *Even a small amount of animal protein in the form of milk cheese meat fish or eggs will supplement relatively large amounts of cereals or legume seed protein* Ten per cent of calories should be protein for an adult and 12 to 15 per cent for a growing child

Why is it that proteins are so essential to health? It is because although other food elements can suffice for the production of energy *nothing but protein can be utilized for building protein parts of the body or replacing protein substances lost in body processes* The muscles the organs the blood the nervous system and the gland products are among the body's protein constituents Antibodies—the substances with which the body fights and conquers disease germs—are also of protein nature Without the proper amount and quality of protein food the body cannot manufacture antibodies and accordingly stands a poor chance of recovery from infections Prospective mothers should have an extra supply of proteins for the needs of the unborn child Children cannot grow without good proteins in their diet They need these foods urgently With deficiency of protein also is associated lack of the important vitamins and minerals contained in protein foods Famine sufferers deprived entirely of proteins become bloated with dropsy This is because when body proteins have become depleted owing to lack of proteins in the diet water tends to accumulate in the tissues of the body

Minerals

These like proteins are building foods

Calcium This mineral is essential for good health and for

strong bones and teeth It is more likely to be deficient in the diet than some other minerals especially where milk and cheese the best food sources of calcium are not abundant or for some reason are not used Vitamin D is essential for the utilization of calcium by the body Sometimes calcium although present in food is not well utilized because sunshine (to produce vitamin D in the body) or vitamin D in food is lacking

It is because of the need for calcium and other minerals that animals and human beings sometimes display an appetite for eating clay The same need explains the habit of gnawing bones It is said that in parts of Africa where the softer portions of bones are gnawed by the native population the people have excellent teeth One should be very reluctant to discourage such a practice unless he has something better to offer Calcium is sometimes added to the diet in various countries by the use of pot ashes in cooking especially the ashes of swamp plants which have been burned as is the practice in some regions of Africa Lime is used for making cakes from maize (tortilla) in Mexico in making bread from rice (banh duc) in Indo-China in soybean curd in China and with the betel leaf and nut in India Burma and Malaya Water used for drinking and cooking may contain lime as well as other mineral salts Egg shells (calcium carbonate) are sometimes ground up and mixed with cereal when no other source of calcium is available

In some parts of the world many kinds of small fish both fresh and dried are eaten *with all their bones* The bones supply calcium to many people who have few other sources of the mineral

In South China an attempt is made to meet the extraordinary need of prospective mothers for calcium by giving them pigs feet to eat Sometimes the pigs feet are cooked in rice vinegar The slow cooking of bones with an acid will dissolve some of the calcium It is said that an average serving of spare ribs cooked with vinegar provides an appreciable amount of calcium

Some varieties of green leaves are among the foods that

furnish small amounts of calcium in the diet of the poor in tropical lands In general green leaves which do *not* have a *high content of oxalic acid* provide significant amounts of calcium Thus spinach although very valuable in other respects is because of its oxalic acid content one of the greens that are *not* useful as a source of calcium Malva however an uncultivated plant which grows extensively on the Mexican plateau is an excellent source of calcium One serving (100 grams) eaten much as we eat spinach can supply half of the expectant mother s recommended daily supply Besides calcium malva contains appreciable amounts of iron and vitamins (vitamin A ascorbic acid thiamin and niacin) [6]

Trained nutritionists and agriculturists should be made available in every country They can advise as to what kind of greens could be raised to advantage in any given place in order to provide the maximum amount of calcium as well as calories and other food values In appendix A the values of certain leafy vegetables used in foreign countries can be found

When sufficient calcium is not present naturally in available food the mineral may be added in medicinal form This is well illustrated by the use of calcium lactate or calcium carbonate in preparing milk from soybeans or peanuts in the recipes given in appendix A Another illustration of the addition of calcium to food is offered by the following plan which has been used by the Red Cross for feeding famine sufferers in North China In this case use was made of the purest chalk available

REFUGEE FEEDING

BREAD

- 60 per cent meal millet etc
- 40 per cent peanut meal or soybean meal

SOUP

- 5 gallons water
- 4 catties meal (yellow corn contains vitamin A)
- 1 catty pork or vegetable oil (lean pork contains protein and vitamin B_1)

[6] See the article Approach to the Nutrition Problems of Other Nations by Robert S Harris *Science* July 13 1945

10 catties fresh vegetable or bean sprouts (allowing beans to sprout adds vitamin C)
½ catty lime stone or chalk (this adds calcium)
½ catty salt
(NOTE The catty of this recipe equals 1⅓ pound)

Sometimes a doctor prescribes tablets of some salt of calcium to supplement the diet for the special needs of patients such as expectant and nursing mothers The recommended daily allowance of calcium can be estimated from the milk requirement under the Guide for an Adequate Diet given earlier in the chapter The amount of calcium in a quart of milk has been estimated as 1 159 grams Thus it would require almost 3 grams of calcium carbonate (chalk) or approximately 9 grams of calcium lactate to furnish calcium equivalent to that in a quart of milk

Phosphorus This is another mineral needed by all in combination with calcium It is safe to assume however that if the need for protein and calcium is met the phosphorus required will be supplied by the same food materials This is true because the common foods which are richest in calcium and protein—milk for example—are the best sources of phosphorus

Iron Iron is well known as a preventive and cure for nutritional anemia It is supplied in the diet by liver egg yolk spinach whole grain cereal dried fruits and molasses among other foods These are all foods desirable for other reasons besides their content of iron A diet good in all other respects is likely to meet the need for iron under usual conditions The physician will make sure that provision is made for prospective mothers special need for iron Anemia in young children is often due to failure to recognize this need during the pregnancy of the mothers

To compensate for any abnormal loss of blood from the body as in hemorrhage or when menstruation is too profuse the doctor besides investigating the cause of bleeding usually treats the patient with iron In malaria destruction of blood by malaria parasites needs to be compensated by the use of iron in medicinal form In hookworm disease as will be explained

in chapter 21 large doses of iron together when possible with a diet rich in iron may prevent symptoms of the disease even in the absence of the usual worm medicines For those who cannot secure the services of a physician a safe provision in any of these special needs would be the use of one or two 5 grain tablets of ferrous sulfate after each meal For children who cannot swallow tablets a liquid preparation of iron such as elixir of ferrous sulfate *in doses proportionate to the age (see* under Iron in appendix C) is preferably administered two hours after meals To prevent staining of the teeth liquid preparations of iron are best taken through a tube

Iodine Sea water seaweed unrefined salt obtained from the sea and sea foods all contain iodine From the soil near the ocean iodine is imparted to drinking water and vegetable produce *In regions too far from the sea to receive this benefit* goiter occurs because of deficiency of iodine The use of iodized salt will meet the need in such places Its use in goiter regions is especially important during adolescence and preg nancy To prepare iodized salt one part of sodium or potas sium iodide is added to 5000 parts of table salt

Sodium Chloride Salt is essential for the life of both animals and human beings It is the only mineral element usually taken separately As has been mentioned additional salt is needed to compensate for excessive loss of salt from the body in pro *fuse perspiration* The Food and Nutrition Board National Research Council reported in 1945

> The need for salt and for water are closely interrelated A liberal *allowance of sodium chloride for the adult is 5 grams daily* except for some persons who sweat profusely The average normal intake of salt is 10 to 15 grams daily an amount which meets the salt re quirements for a water intake up to 4 liters daily [4] When sweating is excessive one additional gram of salt should be consumed for each liter of water in excess of 4 liters daily With heavy work or

[4] One gram is about 15 grains. Five grams may be considered to be ap proximately a *heaping teaspoonful A liter is 33 8 ounces as compared with the 32 ounces contained in a quart.* Four liters is almost equal to 5 quarts

in hot climates 20 to 30 grams daily may be consumed with meals and in drinking water Even then most persons do not need more salt than usually occurs in prepared foods It has been shown that after acclimatization people produce sweat that contains only about 1 5 gram to the liter in contrast with a content of 2 to 3 grams for sweat of the unacclimatized person Consequently after a climatization need for increase of salt beyond that of ordinary food disappears

Fluorine This mineral which is present in excess in the drinking water of some localities giving rise to mottling of tooth enamel is thought to be useful in small amounts for preventing tooth decay It is now available commercially for this purpose but is best applied by the dentist

Copper and Other Minerals These are needed in the diet but will not be discussed in detail because sufficient quantities are insured by taking the foods needed for other reasons

Vitamins

Although these substances are found in foods in infinitesimal amounts they cannot be absent from the diet without danger to health growth and reproduction The need for vitamins for prospective and nursing mothers and for children must be emphasized especially Those most essential to human beings in general are vitamin A the B-complex vitamins (including thiamin [B_1] nicotinic acid [or niacin sometimes called the pellagra preventive vitamin] and riboflavin [originally called B_2 or vitamin G]) vitamin C (ascorbic acid) and vitamin D Vitamins E and K will also be discussed

Much has been learned about the need for vitamins by experiments on the diet of rats The anti-gray hair vitamin (a fraction of the B-complex) capable of restoring color to the faded hair of rats which have been fed on insufficient diets has however proved disappointing when used to restore color to hair of human beings

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tritive values of foods in appendix A will show whether accustomed foods of the reader include the ones required as sources of essential vitamins

Vitamin A Green and yellow vegetables which contain a coloring matter called carotene are useful in producing vitamin A in the body Accordingly sweet potatoes yellow turnips yellow corn (maize) and other yellow vegetables as well as green ones have a content of carotene not offered by the white varieties Yellow corn meal for the same reason is more valuable than white corn meal

Vitamin A already formed is contained in butter liver and kidney egg yolk whole milk cream cheese made from whole milk cod liver oil halibut liver oil salmon and other fish oils Even the body oils of fish such as salmon contain vitamin A Pure concentrates of this vitamin may be taken if desired instead of the oil to supplement insufficient sources in the diet Vegetable oils in general make no contribution of vitamin A with the important exception of the oil of the red palm which is found in some tropical locations

Vitamin A may be destroyed by long exposure to air especially at high temperatures but it is not readily destroyed by ordinary cooking or canning

The B Complex Vitamins There are many vitamins in this group Folic acid used in treatment of anemia and sprue is one of them Another pyridoxine or B_6 is sometimes used in treatment of vomiting due to pregnancy For general purposes of nutrition the most important B vitamins known at the present time are thiamin or B_1 nicotinic acid and riboflavin These are associated especially with protein foods such as yeast milk meat eggs and cereals Ordinary cooking and canning have little effect on these vitamins although exposure to light rapidly deteriorates riboflavin

Thiamin (B_1) This is essential for growth reproduction and lactation Without it the appetite the digestion and the nervous system suffer Indeed carbohydrate foods eaten without thiamin to assist in their utilization produce a poisonous substance which circulates in the blood Nature has placed a good supply of thiamin in the coating of grains such as rice and

wheat but man often removes this coating by refining proc esses as in the polishing of rice and making white flour from wheat In enriched flour thiamin has been added after mill ing It is very important to include either whole grains or en riched products in the diet

Usual sources of thiamin as will be seen in appendix A include beside whole grains meat especially lean pork dried peas and beans nuts green leafy vegetables tomatoes milk egg yolk and yeast Thiamin is needed for health and growth by the young and also by adults It is essential for the efficiency of the digestive and nervous systems Prospective and nursing mothers have a special need for a larger than usual supply of thiamin There need be no fear of taking too much thiamin whereas a shortage is under any circumstances a serious dis advantage

In parts of Africa among other places fermented products provide the chief source of thiamin Until an adequate sub stitute is found in order to supply thiamin without attendant objectionable side effects it might be disastrous to interfere with the use of these fermented products The disease beriberi to be described among other vitamin deficiency diseases occurs in the presence of extreme deficiency of thiamin

Riboflavin Riboflavin is one of the food elements which are well furnished by milk Cheese eggs peas and peanuts liver yeast broccoli and turnip greens are other sources This vita min is important for health and vigor and is said to preserve the characteristics of youth In support of this claim it can be shown at least that animals given liberal amounts of ribo flavin have a longer than usual period of healthy maturity i e the onset of signs of old age is somewhat postponed

Nicotinic Acid or Niacin This vitamin needed to prevent the disease pellagra is found in meat liver and some vege tables notably turnip greens peas kale and tomatoes But carrots cabbage onions lettuce and potatoes all nourishing in other respects have little value in preventing pellagra Milk although low in nicotinic acid content is a needed pel lagra preventive This may be because milk favors the growth of microorganisms which synthetize or manufacture the

vitamin in the intestinal tract The fact that milk contains other nutrients such as protein which are likely to be absent from the diet *when nicotinic acid is low helps to make it* an important food in the treatment of pellagra

Vitamin C or Ascorbic Acid This is needed to prevent scurvy Oranges and other citrus fruits tomatoes cabbage greens and other fresh vegetables preferably eaten raw are the usual sources Dried fruits will not prevent scurvy although they are useful sources of iron vitamin A and B vitamins Of the fresh fruits oranges lemons and grapefruit are better than limes *Bottled* lime juice while affording a refreshing and popular drink where fresh citrus fruits are not available is on good authority[7] considered worthless as a preventive of scurvy Fortunately other citrus fruits and tomatoes and their juices can be cooked and canned without the destruction of their vitamin C content Exposure to air drying and long cooking tend to destroy ascorbic acid

Where citrus fruits or tomatoes cannot be obtained other sources of vitamin C must be found as in fruits like the mango papaya and guava The juice of the red haw in China is said to have a value approximate to that of orange juice The Indian gooseberry rich in vitamin C is eaten with benefit by Indian children in spite of its sour taste

Chlorophyl the green coloring matter in plants is *not* a food element and grass serves poorly as food for human beings Tender green leaves however such as those of the radish or watercress contain vitamin C The diets of some people in India would be seriously lacking in sources of Vitamin C were it not for the pungent and acid condiments such as limes tamerinds garlic and coriander

Eskimos living on meat exclusively suffer no deficiency of vitamin C as long as the meat is eaten raw Where meat is the chief article of diet all parts of the animal may be eaten The brain liver and many other parts of the body have a greater content of vitamin C than has muscle meat In African races

[7] Edward B Vedder in *Clinical Tropical Medicine* Z Taylor Bercovitz *editor (Paul B Hober Inc* Medical Book Department of Harper and Bros p 639

scurvy is common as the result of the destruction of vitamin C by prolonged cooking and steaming of foods

In China the device of sprouting beans has the effect of producing vitamin C Peas lentils and other pulses can likewise be sprouted to increase the supply of this vitamin The following directions may be followed for this purpose *

SUGGESTED METHODS OF PREPARING PEAS LENTILS OR OTHER PULSES FOR THE PREVENTION OF SCURVY IN THE ABSENCE OF FRESH VEGETABLES

1 The dry seeds must be whole retaining the original seed coat and not milled or decorticated

2 They must be soaked in water for several hours the time necessary depends on the temperature—24 hours at 50 to 60 F and 12 hours or less at 90 F

3 The water must then be drained away and the peas etc allowed to remain in the moist condition with access of air They will then germinate and the small rootlets grow out This germination will take 48 hours at 50 to 60 F and 12 to 24 hours at 80 F

Soaking The peas or other pulses placed in a *clean* sack should be steeped in a trough barrel or other suitable vessel full of clean water and should be occasionally stirred The sack and trough etc should be large enough to allow for the swelling of the peas to about three times their original size In a hot climate 6 to 12 hours should suffice for this soaking

Germination The peas should be lifted out of the water and spread out to a *depth not exceeding two or three inches in a trough* or other vessel with sides and bottom porous or well perforated with holes this is to allow *complete* access of air *The seeds must be kept in a moist atmosphere* by covering with damp cloth or sacking which is sprinkled (by hand or automatically) as often as is required to keep the peas thoroughly moist underneath *All vessels should be clean*

4 *It is important that the germinated pulses should be cooked and eaten as soon as possible after germination and should not be allowed to become dry again* in that case the antiscorbutic properties acquired during the process of germination will again be destroyed The pulses should not be cooked longer than necessary

* Manson Bahr *Manson's Tropical Diseases* eleventh edition p 474

It might be added that uncooked sprouts can be used in salads

Where natural sources of vitamin C are inadequate the vitamin can be provided in synthetic form as tablets of ascorbic acid *In time of sickness a tablet may be dissolved* in a fruit drink or in jelly For infants tablets can be added to bottle feedings The amount of the vitamin required under various circumstances may be ascertained by reference to the table of recommended dietary allowances

Vitamin D This is contained in small amounts in egg yolk the flesh of fat fish salmon for example and especially in the livers of lean fish such as cod and halibut Canned salmon is a good source The vitamin can be produced in the body by the action of sunlight on the skin The intervention of ordinary glass *prevents this action but the oiled paper used in* windows in certain parts of the Orient transmits a considerable amount of ultra violet rays Lack of vitamin D may result in the disease rickets

Vitamin D is essential for making the calcium and phosphorus in food available for the formation of bones and teeth It is especially needed by children and prospective and nursing *mothers For this reason it is usual in addition to giving an* extra supply of milk as a source of calcium and phosphorus for people in these classes to prescribe cod liver oil or vitamin D concentrate Viosterol the form in which concentrated vitamin D is often given may be used alone or in combination with halibut liver oil or percomorph liver oil which have an excellent content of vitamin A but are not so rich in vitamin D as is cod liver oil Drisdol a water soluble vitamin D *is useful* for individuals who are allergic to fish oils It also has the advantage of not becoming rancid in hot weather

How is it that children and expectant and nursing mothers native to tropical countries get along without the needed supply of minerals and vitamin D? Actually rickets and osteomalacia an adult form of rickets are common in some tropical countries On the other hand these diseases are sometimes prevented by abundant exposure to sunlight as in the case of

babies playing naked in the sun Incidentally native babies are usually breastfed and often receive supplies of calcium and phosphorus at the expense of their mothers health

Vitamin E This vitamin is essential to reproduction in rats and its absence in their diet results in sterility While it is not certain that vitamin E is necessary for human reproduction its absence or deficiency in the diet of women may have some relation to certain cases of habitual abortion Vitamin E is found in green leafy vegetables and in the embryos of grain Wheat germ oil has been used experimentally as a good source In medicinal form the vitamin is supplied synthetically in tablets of ephynal acetate

Vitamin K Needed especially by pregnant women as a preventive of bleeding of the new born this vitamin is found in egg yolk soybean oil tomatoes hogs liver and green leaves especially spinach kale and carrot tops Usually no concern need be felt about its provision because a diet which is good in other respects provides enough of vitamin K Moreover there seems to be considerable synthesis of this vitamin in the intestine But the presence of *bile* is essential to make possible the *absorption* of vitamin K by the blood Deficiency is most likely to occur because of lack of bile in the intestine as in cases of obstructive jaundice If either because of a poor diet or due to lack of absorption of vitamin K the mother fails to supply the babys blood with the vitamin the child may have a tendency to bleed after birth before a sufficient quantity of vitamin K can be synthesized in its own intestine to take care of its needs Anticipating the need the physician may sometimes prescribe vitamin K in medicinal form either for the mother before delivery or for the infant immediately after birth

Other Vitamins There are other known vitamins besides those discussed here About some of these knowledge is at present inadequate for the evaluation of their significance in the nutrition of human beings If however all the vitamins which have been described are made available there is little likelihood of other important vitamins having been omitted

Circumstances Which Alter the Nutritional Value of Foods

As has been already suggested vegetable produce varies in mineral content according to the composition of the soil The quality of meat and milk depends upon the food provided for livestock Wilted vegetables cereals invaded by insects called weevils and overripe or underripe fruits cannot be expected to be as valuable as foods in perfect condition Overcooking robs foods of vitamins Accordingly vegetables which must be cooked should be taken from the fire as soon as they become tender The minimum amount of water should be used for cooking and whatever liquid remains should not be discarded but utilized in soups gravies or vegetable cocktails Soda should not be added to vegetables since it destroys vitamins Fresh fruits and fruit juices are best consumed as soon as possible after preparation although the loss of vitamin C from exposure is not so great as was formerly supposed and it is in any case minimized by keeping the foods cool and covered until use Milk should not be allowed to stand on the doorstep for a long period after delivery

Gaining New Knowledge about Nutrition

Many of the indigenous people in tropical countries are healthy and apparently well nourished in spite of comparative poverty as the result of using food substances unknown to the foreigner Thus gourds eaten as vegetables may not be unpalatable if prepared as they prepare them Condiments never mentioned in cookbooks sweets made from milk kernels of roasted seeds of pumpkin and watermelon and even things which are rather repulsive to the foreigner as the gray chalk like dried buttermilk so loved by the Bedouin Arab may be the determining factor for the absence of deficiency disease The foreigner should approach such wisdom with respect and willingness to learn Knowledge which his neighbors can share with him may constitute a contribution to the science of nutrition

THE QUANTITATIVE ASPECT OF FOOD

It is important to know not only *what* food elements are needed *to maintain health* but *how much* of each element is essential The Food and Nutrition Board of the National Research Council Washington D C offers a table which may be used as a yardstick for this purpose How much food is required *to produce energy* sufficient for the individual must be computed in terms of *calories* The calorie is a unit of heat It is to be exact the amount of heat required to raise the temperature of one kilogram of water one degree Centigrade The fuel value of food substances is tested by actually burning them in an apparatus called a calorimeter In the body food is burned by combining with oxygen thereby producing heat and energy One gram of carbohydrate in the calorimeter or in the body yields approximately 4 calories 1 gram of protein produces 4 calories also while 1 gram of fat yields about 9 calories The energy needed by the body is provided by the calories in food The need of adults for calories as will be seen in the table of recommended allowances varies from the 100 calories recommended for a woman of sedentary habits to the 4500 required by a man doing heavy manual work In addition to *external* work the body has its *internal* work to do That is to say cell activity the beating of the heart respiration digestion of food the continuance of the muscles in normal tension etc must continue even while a person is resting quietly in bed Persons with an overactive thyroid gland as evidenced by a high basal metabolism rate have so much internal work to do that they remain thin in spite of taking large amounts of food Conversely those with underactive thyroid glands shown by a low metabolism rate become abnormally fat even when consuming no excess of calories A basal metabolism test sometimes throws light on paradoxical situations of this sort During illness the presence of fever delirium or restlessness and losses from the body in discharges as in diarrhea give rise to the need for additional calories as well as additional supplies of certain nutrients

If one consumes more calories than he needs for his degree of activity his body will accumulate fat If on the other hand he takes fewer calories than are required by his activity the body *will consume its own fat* The *overweight* need to cut down their calorie allowance in order to get rid of excess fat

Normal Weight

Tables of average weight for persons of both sexes according to age and height can be found in appendix A The normal weight of certain individuals may not conform exactly to these tables Account must be taken of the weight of bony structure Adults who are of slender build with light weight bones may be healthy and resistant to disease when 10 per cent below the *average weight But even this type of person needs to guard* against extreme light weight during *early* and *middle life* By contrast the large or heavy boned type may be considered normal when 10 per cent or sometimes even 15 per cent above the weight indicated for them in the tables Such persons should nevertheless regulate the diet and activities to combat any tendency to increase in weight above this allowance

After middle age even extreme light weight may not be incompatible with good health In later life it is well to maintain the weight at or a little below the level which is considered desirable for the height and build of any given *individual* at the age of thirty years

Counting Calories

As a help in understanding the practical meaning of calories the following list of 100-calorie portions is given by Rose[a]

APPROXIMATE AMOUNTS OF FOOD TO YIELD 100 CALORIES

Food	Amount
Cooked or flaked breakfast foods	3/4–1 1/4 cups
Milk	5/8 cup whole 1 1/8 cups skim
Cream	1/4 cup thin 1 2/3 tablespoons very thick

[a] Mary Swartz Rose *Feeding the Family* pp 11 and 12 *See bibliography* at end of chapter

Butter olive oil or other fat	1 tablespoon
Bread	1 slice 3 in x 3 1/2 in x 1 in.
Uneeda biscuit	4 crackers
Fresh fruit	1 large orange or apple 1 medium banana or large bunch of grapes 2 medium peaches or pears
Dried fruit	4 or 5 prunes 3 or 4 dates 1/2 dozen raisins 1 1/2 large fig
Eggs	1 exceptionally large 1 1/3 medium
Meat (beef lamb mutton, veal chicken)	About ounces of cooked lean meat
Bacon (cooked crisp)	About 1/2 ounce (4 small thin slices)
Potatoes	1 medium
Sugar	2 tablespoons granulated 3 1/2 full size lumps
Cocoa (made with milk)	1/2 cup
Cream of bean soup	1/2 cup
Macaroni and cheese	1/2 cup
Rice pudding	1/2 cup
Ice cream (made with thin cream)	1/4 cup
Milk sherbet	1/4 cup
Sponge cake	1 3/4 inch cube
Nuts (shelled almonds pea nuts pecans)	About 1/2 ounce
Sweet chocolate	About 3/4 ounce

To this list of 100-calorie portions might be added [1]

Lettuce	2 large heads
Cabbage (shredded)	4-5 cups
Spinach (cooked and chopped)	2 1/2 cups
Lima beans dried	1/6 cup
Navy beans dried	1/8 cup

[1] Adapted from Hazel M Hauck "Nutritive Values of Average Servings of Common Foods" (New York State College of Home Economics at Cornell University Ithaca New York).

Baked beans canned	1/3 cup
Soybeans cooked	1/ cup
Rice brown	2 tablespoons
Flour soy (low fat) whole wheat white	1/4 cup
Cornstarch	3 tablespoons
Sweets corn syrup (dark) honey fruit jelly	1 1/3 tablespoons
Molasses cane	1 1/ tablespoons
Cottage cheese skim	5 tablespoons
Ham boiled smoked (lean)	1 1/ ounce
Red salmon canned	3/8 cup
Sardines canned	4 fish 3 inches long
Apricots dried	9 halves
Grapefruit	1/2 medium
Pineapple	2 slices 1/ inch thick
Plums	4
Tomatoes	4 small 2 cups canned
Green beans	2 cups 1 inch pieces
Beets	4 medium
Carrots	4 young 3–4 inches long
Onions	4 medium
Sweet potato	1 small

Milk and potatoes have been much maligned as fattening foods One large square of chocolate fudge contains as many calories as a medium sized potato or 1 1/8 cups of milk from which cream has been removed And a piece of mince pie 4 1/ inches at the circumference contains four and a half times as many calories as these amounts of potato and milk

Weight Reduction

Taking 2400 to 3000 calories as the average daily requirement for maintaining the weight of adults calories can be cut down by a quarter a third or even one half of the usual allowance according to the degree of overweight But no matter what reduction in calories may be advisable *the needed allowance of protein minerals and vitamins should be guarded jealously* Some cream or butter will be needed every day unless a capsule of halibut liver oil is substituted or some other

provision is made for the needed supply of vitamin A Carbohydrate food is probably the fuel of choice But enough carbohydrates will be furnished in the reducing diet if the fruits vegetables milk and whole grain cereals which are desirable for other reasons are included Candies and pastries should be eliminated from the diet by those who wish to lose weight Saccharine tablets may be used for sweetening purposes if desired It is well to choose fruits for dessert instead of rich pastries and to refrain from using gravy or taking second helpings of anything except salad or cooked greens which are low in calories Lemon juice or vinegar should be used instead of oily dressings Salad dressing made of mineral oil should be avoided since it robs the diet of its fat soluble vitamins A D E and K

When less food is taken than is usual over a considerable period of time weight is sure to be lost although immediate results may be discouraging The number of calories used should not be less than 1 oo except on the advice of a physician At this low level vitamins of the B complex should be taken in addition to food Medicines designed to assist in weight reduction should never be used except on prescription by a physician Taking more than the accustomed amount of exercise is usually indicated however

Increasing Weight

For the *underweight* additional vitamins and especially thiamin are useful for improving the appetite As a rule however three generous well balanced and attractive meals with plenty of cream and butter included together with extra nourishment between meals and at bedtime will result in gaining weight Fruit juices vegex broth and milk shakes containing raw eggs will supply the need for vitamins Brewers yeast powder added to peanut butter makes a nourishing spread for bread and crackers It is better to get one s vitamins in the natural state as constituents of food whenever possible

For the underweight although at least a daily walk out of doors is needed by everyone it may be well to take less strenu

ous exercise than has been customary More than usual sleep and rest is also advisable

NUTRITION AT LOW COST

SOME READERS will be responsible for planning the nutrition of large numbers of individuals as in schools and orphanages and at the same time have a very small *appropriation of funds* In such a case it is well to consider first the nutritive value of *the carbohydrate food commonly used in the area in the* amount consumed This can be done with the help of tables in the appendix Then note the nutrients which are automatically taken care of when the energy needs (i e sufficient calories) are met or nearly met Next consider what other foods are available in small amounts and what they will contribute *Could* some foods be produced or consumed in larger quantities to help make the diet more nearly adequate? Although the goal of good nutrition for the masses may be a long way *off any forward step which can be achieved is well worth* the time and effort it costs In many countries nutritionists and agricultural experts can give assistance in *meeting individual* problems

RESULTS OF VITAMIN DEFICIENCIES

MANY PEOPLE whose health is not so good as it ought to be owe their vague symptoms to vitamin deficiencies Lack of physical stamina mental depression sore mouth and tongue bleeding gums poor appetite and digestion nerve pains so-called rheumatism attacks of faintness or a constant feeling of fatigue *can sometimes be traced to lack of* one or more of these important elements of food It is a mistake however for a patient to try to diagnose and cure his *own condition for the same symptoms which have been mentioned are often due to other causes* While the sufferer delays calling a doctor and experiments with vitamins some dangerous organic disease may progress to a point where even the proper treatment can *be of* no avail The annual check up by a physician gives an opportunity for discussing symptoms and *should* prevent *such an* eventuality

There are certain *well defined diseases* due to deficiency of vitamins Few people with seriously inadequate diets have one deficiency alone Nevertheless the following specific deficiencies present a picture which can be recognized

Deficiency of Vitamin A

Lack of vitamin A results in impairment of the health of the skin Toad skin a roughening of the skin (like goose flesh) seen especially on the arms above the elbow often results from lack of vitamin A and can be cured by administering the vitamin in medicinal form Lack of this vitamin also impairs the mucous membranes which cover or line various parts of the body This may result in abnormal susceptibility to infection of the respiratory tract the eye and other organs of the body Xerophthalmia a destructive eye disease which not infrequently leads to blindness in the tropics and some cases of stone in the kidney or bladder result from serious deficiency of vitamin A Many cases of night blindness i e the inability to see normally in a dim light can be cured by administering the vitamin medicinally

Diseases Due to Deficiencies of the B Complex Vitamins

Beriberi This is a disease due principally to the lack of thiamin It is common in some parts of the tropics occurring among people whose diet consists almost entirely of polished rice from which the coating containing thiamin together with phosphorus and fat has been removed in milling Whether rice is overmilled to the extent of producing danger of beriberi can be ascertained by placing a sample in a dish and covering it with Gram s iodine solution If the entire grain turns black the rice is unsafe for use Safe rice being protected by a portion of the external layers will be only partly stained

Beriberi can be cured by administering as medicine the polishings which have been removed from rice This substance is known in China as extract of tiki tiki

In some places the only item in the native diet capable of preventing beriberi is the fermented drink called toddy When this drink is taken away unless some other source of

thiamin is provided beriberi occurs One type of beriberi is characterized by paralysis of the lower part of the body so that the patient cannot walk In the other type the heart is affected with resulting dropsy giving rise to the term wet beriberi

Infantile beriberi occurs only in breast fed infants whose mothers subsist on a diet deficient in thiamin Removal of the infant from the breast and the giving of extract of tiki tiki results in cure Untreated infants die in convulsions

Beriberi can be treated by administering thiamin in the pure synthetic form or in combination with other vitamins of the B-complex as in brewers yeast Rice is best eliminated from the diet of sufferers from beriberi and less starchy foods used in its place Beans peas peanuts barley whole wheat flour and eggs are recommended supplemented as recovery proceeds by other provision for a well rounded diet When the heart is involved medical care is very imperative

An insufficient amount of thiamin will cause symptoms of nervous exhaustion

Pellagra Pellagra is due chiefly to lack of *nicotinic acid* but other B complex vitamins are also needed for its cure It often but not always occurs in populations living chiefly on corn (maize) meal The use of salt pork does not prevent the dis ease as do fresh meat milk and eggs

Cases range in severity from persons noticing only weakness and a sore tongue and mouth to others suffering from all the other classical symptoms of pellagra including a skin eruption (like sunburn symmetrically distributed and seen especially on the hands and face) diarrhea and mental symptoms progressing to dementia Finally death may ensue if the condition is untreated

Treatment consists of administering the B-complex vita mins Nicotinic acid alone is insufficient thiamin and riboflavin should also be given These may be provided in the form of injections of crude liver extract or by mouth as in brewers yeast Fresh milk buttermilk eggs lean meats liver and kidney meat broths fruit juices and green vegetables should be included in the diet

Cheilosis Characterized by soreness at the corners of the

mouth this disease is often due to deficiency of *riboflavin* and can be treated by this vitamin in pure form Eggs are useful in the diet as are the other foods used in treatment of pellagra

Sprue This disease discussed under the heading of diseases common in the tropics is thought to be due at least in part to deficiency of some fraction of the B complex

Deficiency of Vitamin C

Scurvy This was recognized in former years as it occurred in sailors cut off during long journeys in sailing vessels from all fresh foods The provision of fresh vegetables was found to prevent it

Symptoms begin with a feeling of weakness and mental depression accompanied later by painful bleeding gums and loosened teeth responsible for a disinclination to eat The skin becomes rough and dry is easily bruised and may show small red spots due to tiny hemorrhages about the roots of hairs In scurvy the body becomes painful as in rheumatism because of hemorrhage into the muscles Infants suffering from scurvy when artificial feeding fails to include the use of fruit juice cry out with pain whenever they are handled

Profuse hemorrhage from the nose and mouth may precede death from scurvy These with many of the other symptoms are due to an abnormal condition of the blood vessel walls resulting from lack of vitamin C

Severe cases of scurvy should be kept in bed and fed with milk and orange juice Thirty ounces of orange juice daily will result in rapid improvement Tablets of ascorbic acid in doses of 100 mg three times a day may be substituted for orange juice As the gums and teeth become normal meat potatoes and fresh vegetables are to be added to the diet

Deficiency of Vitamin D

Rickets Evidenced by softening and deformity of bones this is a disease chiefly affecting infants Between the ages of four months and two years symptoms such as bowed legs chicken breast pot belly and squareness of the head are recognized The child is a frail weak and poorly developed

little sufferer and his head often sweats wetting the pillow

Prevention of rickets is best accomplished by giving babies cod liver oil or a vitamin D concentrate such as viosterol or drisdol together with exposure to sunlight The less advantage can be taken of sun baths the more urgent is the need for the provision of vitamin D in medicinal form

Treatment Since it is inadvisable to give an infant more than three teaspoonfuls of cod liver oil daily severe cases of rickets should whenever possible receive a vitamin concentrate Large doses prescribed by a physician should be continued for 2 to 3 months and then gradually reduced to the amount usual for infants Too much vitamin D may be harmful so the lay person should not take the responsibility of giving large doses

Osteomalacia Sometimes called adult rickets osteomalacia occurs principally in women who are secluded in harems because of *religious custom with resulting inadequate exposure* to sunlight It is seen not infrequently in northern China as well as in India Deficiency of calcium in *the diet is* a contributing factor because of the drain of minerals from a mother s body resulting from frequent pregnancies and long *continued breast feeding*

Symptoms in mild cases include pain in the bones of the legs when standing or walking A waddling gait is common *In severe cases great bony deformity occurs* sometimes giving rise to extreme difficulty in childbirth

Treatment of osteomalacia consists in giving foods rich in calcium and phosphorus especially milk cheese eggs and nuts supplemented by Vitamin D in medicinal form Calcium phosphate is beneficial in doses amounting to 3 to 6 drachms (11 6 to 23 • grams) daily

SOME SOURCES OF HELP ON NUTRITION PROBLEMS

India The Secretary Nutrition Research Laboratories Indian Research Fund Association (for reports of the Nutrition Advisory Committee and health bulletins) Coonoor South India

All India Institute of Hygiene and Public Health Calcutta India

China Peiping Union Medical College Department of Biochemistry Peiping
Yenching University Department of Chemistry (W H Adolph and L C Kung) Peiping
Tsinghu University Physiological Laboratory (P S Tang) Peiping
National Central University College of Medicine Department of Biochemistry (L T Cheng) Nanking
Lester Institute for Medical Research (B E Read and H C Hou) Shanghai
National Bureau of Health Nutrition Research Institute (H Wu) Shanghai (located during World War II at Chungking)

Philippine Islands University of the Philippines Department of Biochemistry (Dr Santos) Los Banyos

Java Department of Public Health Nutrition Laboratory (Dr van Veen) Batavia

Hawaii University of Hawaii Agricultural Experiment Station Honolulu (Since the population of Hawaii includes many Chinese and Japanese the information on foods studied in Hawaii may be serviceable elsewhere in the Orient where similar dietary practices occur)

Puerto Rico University of Puerto Rico School of Tropical Medicine San Juan (A bulletin on nutritive value of many tropical foods is in preparation there Many foods used in Puerto Rico are similar to those used in parts of South America and elsewhere in the tropics)

SUGGESTED READING

Mary Swartz Rose *Feeding the Family* fourth edition The Macmillan Company New York 1940

Grace MacLeod and Clara Mae Taylor *Rose s Foundation of Nutrition* fourth edition The Macmillan Company New York 1944

Henry C Sherman *An Introduction to Foods and Nutrition* fourth edition The Macmillan Company New York 1944

L Jean Bogert *Good Nutrition for Everybody* University of Chicago Press Chicago 194

Margaret S Chaney and Margaret Ahlborn *Nutrition* Houghton Mifflin Company Boston 1943

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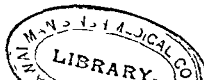
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Note U S government publications are for sale by the Superintendent of Documents Washington 25 D C (list available upon request) Free literature on nutrition can be obtained from the Bureau of Human Nutrition and Home Economics Agricultural Research Administration U S Department of Agriculture and from the health departments of the various states in the United States



J S McLester *Nutrition and Diet in Health and Disease* fourth edition W B Saunders Company Philadelphia 1943

Food and Nutrition revised 194[illegible] The American National Red Cross Washington D C (price 25 cents)

Food for Children Farmers Bulletin No 1674 U S Department of Agriculture Washington D C

Well Nourished Children Folder No 14 Children s Bureau in cooperation with Bureau of Home Economics U.S Department of Agriculture Washington D C

Hazel M Hauck *How to Control Your Weight* revised 194[illegible] pamphlet No E 3 9 New York State College of Agriculture Ithaca N Y

B S Platt *Tables of Representative Values of Foods Commonly Used in Tropical Countries* Special Report Series No 253 Medical Research Council H M Stationery Office London 1945 and British Information Services 30 Rockefeller Plaza New York 20 N Y

Lucius Nicholls *Tropical Nutrition and Dietetics* Baillière Tindall and Cox London 1938

The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets Health Bulletin No 23 Manager of Publications Delhi India

N Gangulee *Health and Nutrition in India* Faber & Faber Ltd London

Radhakamal Mukerjee *Food Planning for Four Hundred Millions* [i e in India] Macmillan & Company Ltd London

Charlotte Viall Wiser *The Foods of a Hindu Village of North India* Bulletin No 2 Bureau of Statistics and Economic Research United Provinces Superintendent Printing and Stationery Allahabad India (price Rs 2–8–0)

Mildred McKie Keithalm M D *Indian Foods and Nutrition* Gandhi Gram Ambathurai Madura Dist (price Annas 12)

Free bulletins on food from University of Hawaii Honolulu

Some Fruits of Hawaii Their Composition Nutritive Value and Use 1936

Japanese Foods Commonly Used in Hawaii 1933

Food for Health in Hawaii 194[illegible]

Vitamin Values of Hawaiian Grown Fruits and Vegetables (Hawaii Agricultural Experiment Station Progress Notes 36 revised 1944)

put off until after the fourth month There should be no contact with contagious diseases *especially German measles*

The health and strength of both mother and child depend largely upon nourishment provided during pregnancy Extra protein calcium and vitamins are needed especially during the latter half of pregnancy The daily quart of milk recommended may be supplemented by calcium and vitamins in medicinal form according to the doctor s advice

Anemia in both mother and child can be prevented by a sufficient quantity of iron The average need of 12 grams of iron is increased to 15 grams during pregnancy In regions where goiter is prevalent iodized salt may be prescribed by the physician

After the birth of the child breast feeding is best in any climate but where milk of good quality is hard to obtain and where germs multiply in it rapidly due to hot weather it is emphatically desirable Unless otherwise advised by her physician the mother should *expect* to nurse her child Some mothers are disappointed in this respect because of inadequate preparation for breast feeding

Sore nipples are one reason for failure and can usually be prevented by care during pregnancy Nipples should be washed with warm water and soap every night then massaged with lanolin or other lubricant to prevent cracking at a later date Application of alcohol once daily during pregnancy is recommended by some doctors Shape nipples to the baby s mouth by pulling them out and rolling between fingers night and morning A nipple shield of rubber or plastic (not lead) should be on hand during the first few days of nursing for sore or retracted nipples This may be a decisive factor in enabling the mother to nurse her child

Milk usually fills the breasts the third day after delivery of the child To insure a sufficient supply throughout the period of nursing the mother should lead a quiet life with plenty of rest and no emotional upsets She will do well to continue a diet rich in proteins vitamins calcium and iron One and a half quarts of milk is the amount recommended for the nursing mother

[11]

A FAMILY IN THE TROPICS

Prospective parents should supply themselves with literature in the anticipation of successful parenthood particularly in the tropics where they will be largely dependent on their own resources The suggestions in this chapter are intended to supplement general information with respect to more special needs in a tropical environment

All seasons in the tropics are not equally favorable for childbirth so it is wise to have births coincide with the most comfortable time of year whenever possible Even more important is choosing a time for pregnancy when a physician will be available to supervise the expectant mother s condition Many women enjoy excellent health during pregnancy and can continue many of the usual activities Certain precautions however should be observed

Strenuous exercise and lifting of heavy objects is forbidden Inhalation of cleaning fluid and insecticides may have a harmful effect and should be avoided The use of quinine for malaria may cause abortion so it is better to use other antimalarials during pregnancy Malaria itself however is more dangerous during pregnancy than is quinine so small doses at more frequent intervals may be prescribed when other remedies are unavailable

The first three months are the period when abortion is most likely to occur Late hours and fatigue are to be avoided especially during the days when the menstrual period would ordinarily have occurred If traveling is unavoidable it should be

put off until after the fourth month There should be no contact with contagious diseases *especially German measles*

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Securing breast milk from a woman other than the child's mother may be advised by the physician particularly in cases where birth is premature It is urgent that the wet nurse in these cases be given a thorough physical examination and measures taken to insure her cleanliness Her own child should also be examined

Bottle feeding may be necessary and in any event a daily relief bottle is generally approved after the first month With this in mind prospective parents should consult the doctor on infant feeding and make arrangements to secure necessary supplies Pasteurized goats or cows milk may be used but buffalo milk is not suitable for infant feeding A table of comparative values of various kinds of milk will be found in appendix A

When supplies of fresh milk are inadequate or of doubtful quality the doctor's choice will often be dried milk or canned evaporated milk In an emergency for feeding an infant until a doctor can prescribe a formula consult the directions given in appendix A

The fact that one does become thirsty in hot weather may account for the almost continuous nursing of native babies A mother who feeds her baby according to schedule must give boiled water to drink between feedings This need for fluids accounts for some cases of high temperatures in new born babies

Supplementary food is required even by breast fed infants With the doctor's approval concentrates of vitamins A and D should be given daily after the baby's second week A teaspoonful of orange juice to furnish vitamin C diluted with an equal amount of water is usually started between the fourth and sixth week and the amount increased gradually Instead of this the doctor may prescribe ascorbic acid dissolved in water or in the bottle feeding Tomato juice may be used remembering that its content of vitamin C is half that of equal quantities of orange juice Juice of the mango has been used successfully for babies and in places where infants are fed with peanut milk or soy bean milk this is often supplemented by plantain water (see appendix A) When a baby is constipated an increase in

the amount of fruit juice given should have a laxative effect Prune juice is especially good for this purpose

Ask the doctor about cereal for the baby As early as the third month of life special baby cereals with vitamins and minerals added may be used Native cereals are too coarse to use for infants unless they are cooked for a long time and then put through a sieve Canned baby foods vegetables strained or chopped with or without meat are excellent but some native vegetables also have been found suitable Vegetable marrow for instance a vegetable commonly used in the tropics agrees very well with babies Begin the use of vegetables in the third month by giving two teaspoonfuls of vegetable water made by mashing such vegetables as spinach or string beans and adding the juice to water to be given between meals A fine paste of strained vegetable can be tried in the fourth month Discontinue foods which seem to disagree

Egg yolk is almost always available and is a good preventive of anemia *A few babies cannot tolerate it In most cases a few* drops of raw yolk is well borne if added to the bottle feeding (after cooling) when the baby is a few weeks old Increasing the amount gradually the baby may in two weeks be getting quarter of a teaspoonful Two per cent of babies are sensitive to egg yolk and cannot take it In such cases a little beef juice will serve Beef steak ground very fine and cooked a little on a skillet without butter or fat may be begun in the seventh month A teaspoonful of this meat mixed with mashed vegetable can be tried and if it agrees with the child given in increasing amounts

When it is possible the mother herself should feed the child Native nurses may not be particular about washing their hands They have been known to chew the food before putting it into the child s mouth It is impossible in a book of this kind to give all the needed directions for infant feeding Such points as have been given are intended principally as a reminder that children should be given all the foods they need Much of the poor health of children brought up in the tropics in former years was due to inadequate nutrition

The layette bassinette and bathing equipment for the in

fant may safely be of the simplest kind Scales should be on hand to check the weight from week to week As the child grows older the crib will assume considerable importance It should be equipped with a mosquito net against mosquitoes and flies A small table and chairs should also be supplied for early supper before the child is put to bed

In tropical countries where smallpox is a common disease vaccination is needed very early Immunization should be attempted as early as the tenth day of life or at the end of the first month When no take results vaccination should be repeated until successful Other immunizing measures will be used by the physician Whooping cough vaccine is usually administered in three injections at three week intervals shortly after the eighth or ninth month of life At the same time diphtheria toxoid can be injected (three doses at monthly intervals) and immunity tested (Schick test) six months later Sometimes whooping cough vaccine and diphtheria and tetanus toxoids are injected together Typhoid vaccine will probably be given not later than the end of the first year

The three major dangers to foreign children in the tropics are malaria intestinal diseases and eye infections The intestinal diseases range from worm infestations evidenced by vague abdominal pains to acute or chronic diarrhea or dysentery In some places round worms are so common that each member of the family has been given a routine weekly dose of worm medicine This is not advised as a general practice however

Loose bowels may result from an excess of fat in the milk fed to infants Chilling of the abdomen and eating of unsuitable foods account for other cases Foods fried in grease coarse cereals fibrous vegetables like corn nuts and certain fruits such as berries watermelon and canteloupe are notoriously indigestible for children Raw apples often cause distress but scrapings from them are easily digested and are often used in treatment of diarrhea The texture of pork and veal renders them less suitable than tender beef lamb and fowl for the young

Chronic diarrhea may be a result of a deficiency of certain food elements particularly vitamins of the B-complex Anemia

caused by iron deficiency may be responsible for diarrhea The rapid multiplication of bacteria in hot weather requires meticulous sterilization of nursing bottles and kitchen equipment such as meat grinders as well as personal cleanliness in all food handlers Children should be trained as soon as possible never to drink water or eat food that may be unsafe

Dysentery is usually recognizable by the presence of blood in loose stools Diapers soiled by infants suffering from dysentery must not be exposed to flies Such diapers preferably made of old muslin should be burned immediately after use The danger of a child s becoming infected outside the home must be considered A definite policy should be formed in the matter of taking children visiting where there is a possibility of unsafe refreshments being served Custom can come to your rescue here Let it be known from the beginning that it is not your custom to take the children visiting By setting this policy firmly in the beginning one avoids risks of offending those whose invitations to the children must be declined

When traveling with children one should provide safe food and drink for the journey Some things bought along the way such as eggs oranges or bananas may be safely eaten after being washed and peeled but it is wise not to be entirely de pendent on such provisions

In highly infected malarial regions triple screening is the practice Besides the bed net double screen doors are used at the house entrance There is usually no reason why children cannot be safely in bed under their nets before the malarial mosquitoes begin to bite in the evening Many doctors advise regular suppressive doses of anti malaria drugs

Eye infections are appallingly prevalent in hot countries In some places scarcely a family among the native population can be found in which there is not at least one blind eye Smallpox accounts for many of these casualties as does trachoma Flies fingers and use of contaminated towels spread such infections In seasons when the flies are very troublesome many European mothers fasten a chiffon veil preferably of dark green around the rim of children s topees Tied around the neck this shields the eyes from flies dust and sand

When there is any evidence of infection a doctor should be consulted immediately

SUGGESTED READING

Literature on Prenatal Care

J Eastman Nicholson M D *Expectant Motherhood* Little Brown and Company Boston

Carolyn C Van Blarcom *Getting Ready to Be a Mother* revised by Hazel Corbin The Macmillan Company New York 1940

Hazel Corbin *Getting Ready to Be a Father* The Macmillan Company New York 1939

Julius H Hess M D and Evelyn C Lundeen R N *The Premature Infant Its Medical and Nursing Care* J B Lippincott Company Philadelphia 1941

Prenatal Care Publication No 4 Children s Bureau U S Department of Labor Washington D C (price 5 cents)

Note U S government publications are procurable from the Superintendent of Documents Washington 25 D C (list available upon request) They can sometimes be secured free of charge from state health departments

Literature on Child Care

Josephine Hemenway Kenyon M D *Healthy Babies Are Happy Babies* Little Brown and Company Boston 1944

L Emmett Holt Jr M D and Rustin McIntosh M D *Diseases of Infancy and Childhood* eleventh edition Appleton Century Crofts Inc New York 1940

Douglas Thom *Everyday Problems of the Everyday Child* Appleton Century Crofts Inc New York 19 7

Benjamin Spock M D *Baby and Child Care* Pocket Books Inc New York 1946

Louise Zabriskie *Mother and Baby Care in Pictures* J B Lippincott Company Philadelphia 1941

How to Bathe the Baby Maternity Consultation Service 1399 York Avenue New York 21 (price 10 cents)

Food for Children Farmers Bulletin No 1674 U.S Department of Agriculture Washington D C

Good Food Habits for Children Leaflet No 42 U.S Department of Agriculture, Washington D C

Publications of the Children s Bureau U S Department of Labor Washington D C

Baby s Daily Time Card (price 5 cents a set)
Infant Care Publication No 8 (price 10 cents)
The Child from One to Six Publication No 30 (price 15 cents)
Child Management Publication No 143 (price 10 cents)
Are You Training Your Child to Be Happy? Publication No 20 (price 10 cents)

[12]

WHAT TO DO IN TIMES OF ILLNESS

CALL THE DOCTOR That is the instinctive reaction to a serious illness in the home In many foreign communities adequate medical service is available Often physicians from among the nationals are fully qualified in countries where medical schools teach modern scientific methods Many a foreigner in the tropics owes his life to a doctor whose color is different from his own

For the average person living in the tropics there will always be a possibility of securing medical aid In remote parts however one may find himself faced with the choice of employing a witch doctor a barber with some reputation for medical skill or some other practitioner of strange healing arts Or he may be able to do something himself in the treatment of family or friends In some instances the call for a doctor may entail a journey of days or weeks and someone must carry on and care for the patient until the doctor arrives

Those preparing for foreign service should when possible avail themselves of Red Cross courses in First Aid and Home Nursing A supply of bed linen a shelf of invalid foods nursing implements and a medicine kit should be kept on hand for times of illness (see appendix C) It is important that all bottles in the medicine chest be clearly labeled with instructions for dosage Drugs should always be kept out of reach of children and preferably under lock and key The bottle of soothing cough syrup containing a negligible amount of an opiate to the dose may be drained to the last drop by a child or a servant hungry for sweets with disastrous results

Learning to use a clinical thermometer is important Reading the mercury level on the sharper edge of this fragile instrument is easily learned Before taking the temperature however the mercury should be shaken down below the 96 mark A quick snap of the wrist while holding the thermometer firmly at the end opposite to the bulb is sufficient to do this Before use the instrument should be washed with cold water *not* with hot The reading will be affected too if the mouth has been warmed or cooled with food or drink In very hot weather when room temperature registers 110 degrees or more the mercury may continue to rise after the thermometer has been taken from the patient's mouth Doctors working under such conditions learn to immerse the instrument in cold water immediately before and after use Cold does not lower the mercury but offsets the effect of the atmosphere

After use the part of the thermometer which has been in the mouth should be wiped with cotton or tissue It should then be washed with soap and water rinsed under running water and dried before being put away After use in a contagious illness the instrument should be allowed to stand in alcohol a few minutes before being put away

The patient should keep the thermometer under the tongue with lips closed for three minutes when the temperature is taken One can count the pulse for sixty seconds and the rate of breathing for another minute then record the findings while waiting The normal on American thermometers is 98.6 on English instruments 98.4 —an immaterial difference On thermometers with the centigrade scale normal is 37

Illness in some individuals is often marked by a rise in temperature others may be quite ill without fever A child may develop fever for no apparent reason Only when the temperature is maintained above the level 99.6 for a considerable time or continues to rise need a diseased condition be suspected

When the thermometer cannot be retained under the tongue as with young children or unconscious persons temperature may be taken rectally When no rectal thermometer is available one of the ordinary variety may be used without

injury to delicate tissues if care is taken In any case the bulb should be well lubricated with vaseline before insertion The thermometer should be left in the rectum for five minutes Normal rectal temperature is almost one degree higher than oral temperature and readings must be discounted accordingly

When there is a rise in temperature patients should be put to bed Weakness severe pain or disability also suggest bed Both adults and children may object to this measure With the child one must be firm Special privileges such as cutting pictures from old magazines or using favorite crayons may help in making small patients content with temporary inactivity Adults may be less tractable but most reasonable persons will realize that exposure to chill and fatigue may have painful results

Keeping a feverish patient in bed may prevent spread of infection to others Most contagious diseases are unrecognizable in the early stages Measles begins with a feverish cold and scarlet fever with a sore throat accompanied by headache vomiting and a rise in temperature *The danger of contagion* is often greatest during the days before diagnosis is made A separate bedroom is a practical kind of quarantine

When symptoms are not due to serious infection they usually subside quickly after the patient has been put to bed But even after a few days of illness it is well to continue bed rest for twenty four hours after the temperature has subsided and *continued normal Activities are to be resumed* gradually with frequent rests until strength returns

When immediate medical aid is unavailable the voluntary attendant must try to be both doctor and nurse With good nursing and simple measures for relief and support the likelihood of recovery is increased What can the attendant do for the patient? He can give expectant treatment supportive treatment and symptomatic treatment Sometimes he can administer the specific treatment as when anti malaria medicine is needed for a patient suffering from malaria

Expectant treatment is given before diagnosis can be made The patient can be made *comfortable as far as possible* Those

who have had a course in home nursing enjoy a definite advantage in seeing to this but even the reading of a textbook on home nursing is very helpful Anyone who has been a patient himself will remember what a difference good nursing made

Common sense will remind the attendant to arrange the sickroom conveniently removing superfluous furniture arranging for fresh air and sunshine while preventing draught or glare A sponge bath given in bed with one part of the body at a time being uncovered is refreshing after a restless night as is having the back rubbed with diluted alcohol

Patients with a high temperature or those who are otherwise very ill should not get out of bed to go to the toilet A bed pan should be provided or when this is unnecessary a commode can be placed beside the bed In any case chilling and fatigue are to be avoided When the nurse has other duties than that of caring for the patient a bell should be placed on the table bedside the patient s bed A pitcher of water or lemonade with a glass should also be left on the table

Besides making the patient comfortable expectant treatment consists of watching for any symptoms that may arise Trained nurses follow a routine of taking the temperature pulse and rate of breathing every four hours and recording the findings with the day s date and the hours of observation Notations should be made as to nourishment or medications given amount of fluid taken the time of voiding and amount of urine movements of the bowels as well as any complaints *made by the patient or changes in his condition If a rash is* seen on any part of the body or a cough develops details concerning the nature and location of the rash the character of the cough and appearance of sputum should be recorded It is advisable to keep some sort of written record particularly if a physician is expected later Such observations will be of great help to him

To count the pulse one places the fingers on the thumb side of the patient s wrist just above the line where it joins the palm On the outer side of the tendons or leaders a throbbing will be felt These throbs or pulse beats are counted during the

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To count the pulse one places the fingers on the thumb side of the patient s wrist just above the line where it joins the palm On the outer side of the tendons or leaders a throbbing will be felt These throbs or pulse beats are counted during the

course of a minute as measured by the second hand of a watch The number of respirations per minute is then noted Keep ing fingers on the pulse while watching the rise and fall of the chest or bed clothes will enable one to count the respira tions without making the patient self conscious about his breathing

The normal pulse rate for the average adult male is about 70 per minute In women the rate is often nearer 80 The heart of a new born baby beats about 124 to 144 times a minute At the age of two the rate varies from 105 to 90 and after that a gradual slowing continues until the adult pulse rate is reached When there is fever the pulse is usually quickened to the ex tent of 10 beats for every degree of fever Thus with four de grees of fever (102 6°) one would expect a man to have a pulse rate of 110 In typhoid fever however with a temperature of 103° the pulse rate may be only 80 or 90

Temporary quickening of the pulse may result from nerv ousness or excitement but a persistently rapid pulse even without apparent illness should receive a doctor s attention Irregularities of rhythm should also be reported The apparent skipping of beats or occasional thumping of the heart in an otherwise normal person however may have no greater sig nificance than an indication of fatigue or nervousness

The rate of breathing when fever is present may be expected to exceed the normal 18 to 20 breaths a minute In pneu monia when lungs are greatly congested respirations may number 30 to 60 per minute In such a case opening windows or moving the bed to a veranda will provide more oxygen Propping the patient up in bed may ease breathing

Infection of the throat may cause fever This may be tonsil litis or a more diffused inflammation Inspection can be made by using the handle of a spoon as a tongue depressor If throat infection is suspected the examiner should cover his own nose and mouth while making an inspection Abnormal swelling or redness may be observed in some cases or perhaps a grayish or whitish membrane or yellowish spots on the tonsils Mothers should familiarize themselves with the appearance of their children s throats so that changes due to illness can be recog

nized Large tonsils are not necessarily diseased In throat in fections glands the size and shape of beans can often be felt under the skin at the sides of the neck particularly in cases of German measles

In cases of nose and throat infection dishes and silver used by the patient should be sterilized by boiling Abnormal dis charges from the nose throat and intestines many contain dan gerous germs and should be disinfected In coughs or throat infections sputum may be caught on gauze or paper handker chiefs and burned Diarrhea with gradually rising and long continued high temperature suggests the possibility of ty phoid fever and the need for disinfection of sewage In dysen tery and cholera also the need for disinfection is urgent Every household should have some disinfectant on hand for such purposes

Eight ounces of crude carbolic acid added to a gallon of water makes an effective disinfectant solution Other equally good ones are made by adding to a gallon of water 14 ounces *of formalin 3 ounces of cresol or 8 ounces of chlorinated lime* Make sure that the chemical is completely dissolved and that the bottle in which it is stored is tightly corked and labeled POISON These solutions are to be used full strength only for disinfecting faeces and urine for other purposes they are to be diluted with two parts of water

For disinfecting faeces or urine an amount of disinfecting solution equal to the discharges should be added Hard lumps should be broken up with a stick Cover the mixture and let it stand for an hour or two before disposal Patients with ty phoid fever or diarrheal diseases should preferably use more than one bed pan While discharges in one pan are being treated another will thus be on hand for the patient Cloth ing and bed linen soiled by discharges should be soaked for two hours in the disinfecting solution diluted with two parts of water They should be boiled before being sent to the laundry

When emptying the bedpan it is ideal for the attendant to wear rubber gloves in case the patient is suffering from an intestinal infection If this is impossible the hands should be

scrubbed carefully with soap and water giving especial attention to the spaces under fingernail after possible contamination As an additional precaution the hands may be soaked for a minute after washing in an antiseptic solution For this purpose one blue tablet of bichloride of mercury containing about 7 grains may be dissolved in a pint of water or a teaspoonful of lysol may be added to a pint of water After the use of lysol the hands should be rinsed in water

Bichloride of mercury solution must not be used for disinfecting faeces since it does not penetrate solid matter

A smock or apron to be donned on entering the sickroom and removed when leaving should hang just inside the room to prevent spread of infection When the disease is one against which vaccination is effective all those who may have been exposed should be revaccinated

In the absence of a physician the attendant will need to know how long to isolate the patient Information as to the incubation period (the time usually elapsing between exposure and first signs of a disease) will enable him to assure himself that others in the household have not contracted the infection A table of information about communicable diseases is given in appendix B

When the patient has recovered from a contagious or infectious disease the sick room must be made safe for occupancy by others Scrubbing the floor walls and furniture with soap and water hanging rugs and blankets in the sunshine will usually be sufficient After scarlet fever or smallpox bed linen should be boiled After smallpox where discharges are very infectious the mattress and bedding which cannot be boiled or sterilized with steam should be burned Invalid quarters should be treated with DDT or fumigated with sulphur after diseases conveyed by insects such as in typhus fever or plague

Supportive treatment is accomplished by means of nourishment Starvation or vitamin deficiency usually decreases the likelihood of recovery In long continued illnesses like typhoid fever it is a grave mistake to be afraid to feed the patient Fever increases the need for calories in food It will not matter seriously if for a day or two nothing but water is accepted or

retained but as soon as the patient can take it appropriate food should be made available to him While fever is high nourishment in fluid form is safer later as he improves soft or semi solid foods can be added to the diet During convalescence a full but easily digested diet is in order Not until complete recovery is made should food include other than simple easily digested dishes Meals as attractively made up as possible should be served regularly

The following plans by Rose show how a sufficient number of calories with all needed food elements can be given at each stage of illness [1]

A FLUID DIET FURNISHING 2000 CALORIES

4 00 A M 1 cup orange juice with 2 tbsp lactose (milk sugar)
6 A M 1 cup milk
8 A M 1 cup gruel one tbsp pablum [2] ¼ cup cream ½ cup milk
10 A M Eggnog 1 egg ¾ cup milk 1 tbsp lactose 1 tsp sugar vanilla speck of salt
12 M 1 cup cream soup ⅓ cup pea pulp ⅓ cup cream ⅓ cup milk
2 P M 1 cup pineapple juice with 1 tbsp lactose
4 P M Eggnog as at 10 A M
6 P M Cereal gruel as at 8 A M
8 P M 1 cup milk
12 00 A M Eggnog as at 10 A M

A TYPICAL MENU FOR A SOFT OR SEMISOLID DIET FURNISHING 2000–2200 CALORIES

6 00 A M 1 cup hot milk (may be flavored with tea or coffee)
8 A M ½ cup orange juice
⅔ cup cooked farina with added vitamin B_1
¼ cup thin cream for cereal
1 thin slice toast with butter
10 A M ½ cup orange juice

[1] From Mary Swartz Rose *Feeding the Family* fourth edition pp 296–299 By permission of The Macmillan Company publishers

[2] A specially enriched cereal for infants and invalids For other foods of this type consult *Accepted Foods* The American Medical Association (1940)

1° M ¾ cup cream soup
2 30 P M ½ cup prune juice with 1 tbsp lemon juice and 1 tsp sugar
5 P M *1 cup hot milk flavored with tea coffee or cocoa*
1 thin slice toast with butter
7 P M ½ cup vegex bouillon
A one-egg omelet
1 thin slice toast with butter
½ cup junket flavored with cocoa or caramel
10 00 P M 1 cup gruel or malted milk
1 thin slice toast with butter

GENERAL PLAN FOR A CONVALESCENT DIET

BREAKFAST ½ cup orange juice
Small serving of cereal either cooked or ready to-eat (giving preference to those with added vitamin B_1 or adding a small portion of wheat germ)
½ cup thin cream for cereal
A soft cooked egg
A thin slice of toast and butter
Coffee or tea half hot milk or a glass of milk
10 30 A M A cup of milk or an eggnog or a glass of fruit juice
LUNCHEON Meat broth with rice barley or vermicelli or cream soup (potato pea asparagus or tomato)
Roast or broiled lean meat (beef chicken lamb) or fish
Potatoes baked boiled or mashed or macaroni or rice
Buttered green or yellow vegetable (spinach carrots *peas asparagus tips*)[8]
Toast stale bread or plain crackers and butter
A simple dessert (ice cream custard lemon milk sherbet junket gelatin jelly or mild stewed fruit)
A cup of milk
3 30 P M *½ cup mixed fruit juice (grapefruit and* pineapple prune with a little lemon juice orange and grapefruit) or orange juice
SUPPER An omelet soufflé or small lamb chop
Toast or a small baked potato or rice
A cup of milk

[8] Small cans of chopped vegetables offered especially for young children are excellent for use in invalid feeding

Stewed or baked fruit (prunes apples pears bananas)
10 00 P M A cup of hot malted milk

When a patient expresses a longing for certain foods it is well to comply with his desire unless the food he wishes is thought to be harmful Ice cream is a favorite and useful form of nourishment for tempting the appetite When the temperature has become normal a longing for meat can usually be gratified if the following directions given by Bercovitz are followed *

A simple way of preparing meat is to take lean beef and pass it through the meat-chopper twice then place it in a pan to which has been added a small amount of water If the chopped meat is stirred into the water as it is being cooked it breaks up into relatively fine granules of meat and the beef extract with the meat granules is finally left This forms a very palatable base to which boiled rice macaroni or noodles can be added as desired Butter to suit the taste may be added

New foods should be introduced cautiously in the case of a patient who is seriously ill If diarrhea a rise in temperature or any other undesirable result follows the experiment of giving a small portion the offending food should be withdrawn at once

Until a doctor can be secured *symptomatic treatment* may be advisable Even without a diagnosis something can be done to relieve the patient s distress Usually the first measure thought of after the patient is in bed is *giving some form of laxative* Constipation may be the cause of fever and in the absence of abdominal pain and tenderness may be relieved by a laxative Headache from congestion in the sinuses or soreness of the throat is often lessened by free movement of the bowels Epsom salts milk of magnesia or other laxatives may be used *Never use castor oil as a remedy for constipation* It will move the bowels and is useful for removal of the irritant in diarrhea or in acute digestive upsets but its after-effect will be constipation

* Z Taylor Bercovitz *Clinical Tropical Medicine* (Paul B Hoeber Inc Medical Book Department of Harper and Brothers) pp 562-563

The following warning should never be forgotten

In appendicitis typhoid fever or other conditions of inflammation in the abdomen it is dangerous to give a laxative Such action may result in rupture of an abscess or ulcer with resulting peritonitis Abdominal pain with tenderness and stiffening of muscles over the tender spot when pressure is applied is a positive indication that purging is under no condition to be attempted When there is no possibility of securing a physician s aid and it seems really necessary to move the bowels an enema consisting of one pint of lukewarm water in which a teaspoonful of table salt has been dissolved may be introduced into the rectum slowly by holding the receptacle of water only a few inches above the level of the patient

When *bloating of the abdomen* is due to the presence of gas and there is no suspicion of appendicitis or other inflammatory process an enema may be given or turpentine stupes applied to the abdomen Stupes can be made by sprinkling turpentine on a piece of flannel which has been wrung out of hot water They should be removed when patient complains of tingling

Some people have *difficulty in passing urine* while lying on the back Usually it will do no harm for the patient to sit up In some cases water may be trickled into the bedpan over the genitals thus arousing the impulse to void In paralytic cases a firm and gentle pressure over the lower part of the abdomen where the bladder is felt to be distended may be effective

The *relief of pain* may be accomplished in many different ways Heat has a relaxing effect on tense and painful parts of the body as in painful menstruation It speeds the ripening of boils and hastens the relief which follows discharge of their contents Fomentations made by wringing cloths out in hot water are excellent as are electric heating pads and hot water bottles

Pain which may be due to appendicitis (or other abdominal inflammation) is *not* to be treated by application of heat! It may cause rupture of the appendix Applied to an abscessed ear indicated by fever accompanied by earache heat may have an equally disastrous effect

Cold may be applied by means of an ice bag or a cool wet

cloth It is often more effective than heat for the nerve pains of neuralgia or in earache and sometimes serves to retard an inflammatory process

Aspirin is a useful and relatively safe drug for relief of many kinds of aches and pains A few people may be unable to take it If irritation of the stomach follows its administration a quarter of a teaspoonful of baking soda taken with each dose may help When this does not remove objections it is better to desist in trying to use aspirin The following is a good rule for the untrained nurse *Never insist on a patient s taking food or medicine to which he believes himself to be peculiarly sen sitive*

Paregoric a preparation containing a little opium is a useful drug for emergencies A baby a month old crying from pain in acute illness may be given one drop in a little water At a year of age the dose is 10 drops Repeat the dose in two hours if necessary The drug has a constipating effect It should not of course be given in habitual colic

Tablets containing $^1/$ grain of *codeine sulphate* may be used to ease pain in emergencies for which aspirin is not sufficient The two drugs may be given together using two tablets of aspirin and one of codeine For a child one year old $^1/_{\ 0}$ grain of codeine may be used and at four or five years the dose may be $^1/_{12}$ to $^1/_6$ grain

For the relief of agonizing pain *morphine* is needed Doc tors use it to combat both pain and shock in serious injuries except in head injuries If no physician is within call in a com munity some responsible person should be equipped with morphine in case of emergency

A tube of hypodermic tablets is a convenient form in which to provide morphine In these $^1{}_8$ grain of morphine may be combined with $^1/_{150}$ grain of atropine sulphate the latter drug being added to counteract the tendency of morphine to de press the breathing Hypodermic tablets may be given with a drink of water as well as by injection

Only when absolutely necessary should morphine be given to small children Delicate poorly nourished infants are es pecially likely to react unfavorably to the drug To a strong in

fant of one year the dose may be $\frac{1}{30}$ to $\frac{1}{4}$ grain Although hypodermic tablets are too small to be cut by a knife for division into smaller doses a tablet can be dissolved in a definite quantity of water measured in drops and the resulting solution portioned as desired

In appendicitis and other inflammatory abdominal conditions *morphine given before the arrival of the doctor may* mask the symptoms and hinder diagnosis The habit forming nature of morphine is well known It should not be used for menstrual pain or other conditions which constantly recur

Fever indicates the body s response to disease In some cases it is possible to remove the cause of fever In malaria treatment with anti malaria medicines destroys the malarial organisms and removes the fever In case of patients who have been exposed to malaria or have had previous attacks it is a good plan to suspect any fever (or even dysentery or apparent heat stroke) of being due to malaria germs If no doctor can be consulted try giving anti malaria medicine If the guess has been correct symptoms should abate If not no harm need be anticipated because of this treatment

A cool airy place should be selected for the feverish patient and he should be given copious amounts of cool water to drink If the temperature taken by mouth reaches 103 sponge the body with tepid water This will appreciably lower the fever Aspirin also may reduce the temperature If the temperature reaches 105 wrap the patient in a wet sheet Keeping the sheet wet for evaporation will be more efficient than sponging If the lips become blue under this treatment the cold should be removed and the body rubbed with a towel and wrapped in a light blanket

When *delirium* occurs the patient must be closely watched To quiet him a dose of 1½ grains of phenobarbital may be *given and repeated after 4 hours if necessary* When delirium cannot be controlled in this way a tablet of morphine may be used

Faintness or collapse may be treated by giving ½ to 1 teaspoonful of aromatic spirits of ammonia in a little water Hot

tea and coffee are other useful stimulants Warm covers should be applied

Vomiting may be an early sign of infection as in scarlet fever Do not try to administer food while the stomach is unretentive Cracked ice may be held in the mouth at first Later sips of ice water may be retained A mustard plaster applied over the pit of the stomach may decrease nausea and vomiting

When vomiting is due to indigestible or poisonous food it serves a useful purpose A dose of castor oil will help rid the stomach of the irritant and will often be followed by cessation of vomiting It must be remembered however that vomiting may be a symptom of appendicitis in which case castor oil must not be given

Diarrhea is discussed elsewhere on pages 82–83 and 183–184

Sore throat is a common symptom Soreness can often be relieved by irrigating the throat with very warm salt solution using 4 teaspoonfuls of salt to 2 quarts of water A fountain syringe is used to direct the flow over the inflamed surfaces while the mouth is held over a basin to catch the overflow The syringe should be sterilized by boiling for 10 minutes before and after use Aspirin in 5 grain doses repeated every 4 hours will help give relief The throat may also be swabbed with 10 per cent argyrol or 1 per cent silver nitrate solution Inhalation of steam is beneficial when the lining membrane of the throat and bronchial tubes is dry and irritated

Cough may be treated by various cough medicines according to the stage of the condition In the early stages when the cough is dry and tight syrup of ipecac is useful An adult may take 15 drops in water every 3 to 4 hours or a child of one year 5 drops If nausea occurs the dose should be decreased

For an incessant cough which keeps the patient from resting ¼ to ½ grain of codeine sulfate may be given every 3 hours until relief is obtained

Pneumonia is not an infrequent cause of death among residents of tropical countries Cardinal symptoms are a chill fever pain in the side cough and expectoration of rusty sticky sputum Delirium may occur with fever of 104 or

Buffered tablets for oral use are *effective when given in* doses four or five times greater than the dose needed by injection Sometimes a doctor may give one dose by injection and leave instructions for subsequent doses to be administered orally When given orally the drug should be taken on an empty stomach i e not less than ¼ hour before a meal nor less than 1½ hours after eating Oral tablets usually contain 100 000 units For pneumonia for instance in case no doctor can be secured two of these tablets or 200 000 units should be administered as soon as the diagnosis is made After this one tablet or 100 000 units is to be given approximately every 3 hours with adjustment to meals day and night for at least 3 days This in successful cases will usually be at least 48 *hours after the patient s temperature has returned to normal*

Doses for children can be calculated in relation to the weight of the child Considering 150 pounds to be average weight for an adult a child weighing 75 pounds would be given half the adult dose For infants the tablets may be dissolved in the formula given

The use of aspirin should be avoided during administration of penicillin because it may lower temperature and mask the effect of the penicillin Codeine however may be permitted in treatment of cough Hives are among the unfavorable reactions to penicillin Sometimes by giving an antihistamine drug such as benadryl or pyribenzamine the eruption can be controlled so that administration of penicillin can be con *tinued*

Obviously no specific treatment can be given intelligently until at least a tentative diagnosis has been made When no medical aid can be secured experienced neighbors may be able to give help in recognizing diseases with which they are familiar Once the nature of the illness is understood it is not difficult to search a medical textbook for treatments within the scope of the untrained nurse

In his concern for his patient the attendant must not neglect his own health He must protect himself not only from disease germs but from fatigue and worry For the patient s sake he must appear confident and cheerful In case of failure he must

remember that even the most skillful physician with all the resources of modern science cannot save all his patients He can only do *his* best and leave the rest

SUGGESTED READING

Lona L Trott R N B S *American Red Cross Textbook on Home Nursing* The Blakiston Company Philadelphia 1942
Elinor Norlin and Bessie Donaldson *Everyday Nursing in the Everyday Home* The Macmillan Company New York 1942
Lyla M Ilson *Improvised Equipment in the Home Care of the Sick* W B Saunders Company Philadelphia 1939
Florence Dakin and Ella M Thompson *Simplified Nursing*, J B Lippincott Company Philadelphia 1941
L Jean Bogert and Mame T Porter *Dietetics Simplified* The Macmillan Company New York 1940
Caring for the Sick John Hancock Mutual Life Insurance Company Boston (free pamphlet)
Home Care of Communicable Diseases John Hancock Mutual Life Insurance Company Boston (free pamphlet)
The Ship s Medicine Chest and First Aid at Sea Miscellaneous Publication No 9 U S Public Health Service and War Shipping Administration 1947 for sale by the Superintendent of Documents Washington 25 D C
Harry Beckman M D *Treatment in General Practice* W B Saunders Company Philadelphia 1942 (This book is intended for physicians and medical students it is recommended only for the rare cases of those who must live where medical help is unobtainable)
Thomas T Mackie *Manual of Tropical Medicine* W B Saunders Company Philadelphia 1945



[13]

COMMON AILMENTS

THE COMMON COLD is too well known to require description Sufficient rest and sleep exercise in the open air and a well balanced diet do much to increase resistance although nothing has been found which will guarantee immunity

When fever occurs with a cold bed rest is imperative to prevent infection spreading to the sinuses ears and bronchial tubes The old fashioned plan of treatment consisting of a hot bath a laxative and measures to produce sweating in bed seems to have stood the test of time Sweating should not be induced unless the patient can stay in bed on the following day Much water or lemonade should be taken in any case Dryness in the throat is best treated by inhalation of steam For a baby the old remedy of rubbing the chest with camphor ated oil may be beneficial A little oil of eucalyptus placed on a handkerchief and left on the pillow near the baby s nose seems to have a good effect Nose drops of paredrine hydro bromide aqueous may be used to open the air passages of adults or children

Some young children have frequent attacks of *croup* This may occur with a cold or quite without warning A hoarse cough may waken the parents The child seems to be in danger of suffocation and it is difficult not to be alarmed The condi tion is due to spasm or swelling of the larynx The morning after the attack all symptoms may have disappeared Steam in halations from a regular or improvised croup kettle may be used effectively Another remedy is swallowing half a teaspoon

ful of plain melted vaseline Syrup of ipecac is also easily ad ministered Five drops in a little water may be given to a young baby or ten drops to a child of two years

Very often the cause of *headache* is known and can be re moved Eyestrain constipation fatigue and malaria are com mon causes Migraine is the name given to an extremely pain ful and incapacitating type of headache more common in women than in men It recurs at intervals affecting the same part of the head consistently Attacks may coincide with peri ods of strain or with menstruation

For relief of severe headache the patient should go to bed in a quiet darkened room Hot or cold applications to the head may ease the pain Aspirin taken in 10 grain doses and repeated every 3 hours when necessary may be helpful Treatment for malaria may be indicated A physician will need to study each case of headache individually

For *earache* when there is no fever a hot water bottle may be applied to the ear and a dose of aspirin given If this is not enough bland warm oil such as mineral oil may be dropped into the ear

When earache is accompanied by fever infection of the mid dle ear must be suspected Mastoid abscess causes pain and tenderness in the bony prominence directly behind the ear Cold should be applied instead of heat in such cases No time should be lost in consulting a doctor The use of penicillin or a sulfa drug may prevent the need for operation

An abscess of the middle ear may rupture spontaneously or the doctor may puncture the ear drum to release the pus A running ear should be kept clean by using a cotton swab wet with boiled water For a chronic discharge syringe gently with a bulb syringe employing a solution of a teaspoonful of boric acid powder in a cup of warm boiled water If the dis charge has a foul odor syringe with a solution of potassium permanganate made by dissolving in hot water enough of that chemical to impart a light red color

The teeth should be checked semiannually or at least annu ally by a dentist A good diet and careful cleansing of the teeth do much to prevent decay In case of *toothache* one must look

for a cavity Food retained in a cavity must first be cleaned out Then a tiny pledget of absorbent cotton wet with oil of cloves is to be inserted into the cavity and covered by a bit of dry cotton Aspirin also will be of benefit

Menstruation is normally painless When cramps occur they may be due to faulty hygiene as when fatigue results from keeping late hours or when too little exercise is taken For some women the taking of a laxative when the flow is expected seems to prevent pain After pain begins 10 grains of aspirin with a hot drink may be all that is needed If it is necessary to go to bed a hot water bottle placed over the lower part of the abdomen will be helpful Recurrent pain should not be tolerated without consulting a doctor

Acid indigestion may be a misleading term Symptoms thought to arise from indigestion may have their origin in the heart and vice versa The periodic check up with the doctor will give an opportunity to investigate the real cause of discomfort In some cases nervous tension or worry may be at the root of the trouble This is true also of irritable colon often wrongly called colitis

When excessive acid in the stomach is really the cause of discomfort symptoms are relieved by taking food or alkalis such as baking soda Such a case may prove to be one of peptic ulcer If discomfort comes about two hours after meals when the stomach is empty try eating a few crackers or a piece of bread together with a drink of milk if possible Aluminum hydroxide in either liquid or tablet form will usually give temporary relief at this time Until a doctor can be found to prescribe for the case diet should be bland and easily digestible including no fried foods sour foods raw fruits or vegetables or highly spiced dishes Very hot and very cold food or drink should also be avoided Unless meat is very soft and tender it should be ground and vegetables containing seeds or fibers such as celery peas or corn should be put through a sieve before consumption Rest and relaxation should be provided

Constipation should be controlled without the habitual use of laxatives The laxative habit often leads to irritable colon

Enemas and laxatives may be used as emergency measures but as a rule the taking of a laxative diet and more exercise than usual can overcome the condition Mineral oil should not be used day after day since it robs the body of the fat soluble vitamins contained in food An abundant supply of laxative foods should be included in the diet Foods rich in thiamin (B_1) are especially useful These include wheat germ and dried brewers yeast or yeast extract Whole grain cereals and bread bran vegetables rich in celulose such as celery string beans lettuce and cabbage are useful and some of these are preferably used raw Fruit should be eaten liberally at every meal and fruit juices taken frequently Prunes and other dried fruits rhubarb figs lemons oranges tomatoes and apples usually have a laxative effect as do olive oil molasses and honey Water should be drunk freely A teaspoonful of salt added to a quart of water acts as a laxative

In discussing the treatment of constipation it should be explained that some perfectly healthy people have a movement of the bowels not oftener than once in two or three days So long as health is good and no discomfort is felt there is no need for anxiety On the other hand constipation may be a manifestation of fatigue and treatment may need to be directed to the general condition of the individual

One should arrange his schedule to allow time for a visit to the bathroom after breakfast or at whatever time the bowels are most likely to move Many people find that by taking a glass or two of warm water on arising in the morning the problem of constipation is met A few ounces of orange lemon or prune juice added to the water increase its effectiveness A good breakfast should be eaten and all the meals should contain considerable bulk This is contributed without unduly increasing calories by including a generous supply of green leaves in the diet

Hemorrhoids (piles) consist of dilated veins in the rectum Bleeding may occur with bowel movements A doctor should be consulted For advanced cases surgery is effective Treatment in the early stages consists in the use of a laxative diet and avoidance of long hours of sitting After bowel movements

[14]

MEETING EMERGENCIES

YOUR FORETHOUGHT in providing a first aid kit and in studying and keeping handy a *First Aid Text Book* [1] may be of invaluable help to those about you If you have actually studied first aid your assistance will be even more useful Certainly your success in preventing accidents will have a direct relation to the habitual carefulness you develop in removing potential hazards as soon as they are noticed

In the study of first aid one learns that the three kinds of injuries most urgently requiring immediate aid are (1) severe bleeding (2) cessation of breathing and (3) poisoning Even when the doctor arrives within fifteen minutes after the accident he may be too late in such cases unless first aid has been administered You should completely familiarize yourself with the Red Cross *First Aid Text Book* to meet common emergencies Additional treatment that may be given for specific emergencies is suggested below in this chapter

Fractures Follow treatment recommended in the first aid handbook The pioneer in remoter sections may have to care for a broken arm or leg for a considerable period before a doctor can be secured Routine first aid instruction does not prepare him for this When pain is severe the first step is perhaps to give the patient a dose of ⅛ grain of morphine Then the injured limb is to be gotten into as nearly normal shape as possible by applying traction as described in the first aid hand

[1] American Red Cross *First Aid Text Book* revised edition (The Blakiston Company Philadelphia Pennsylvania)

book If it is at all possible to secure medical help broken bones which protrude should not be made to return to their normal place by anyone but a doctor Penicillin or sulfa drugs are used to *prevent* infection in a compound fracture

In fractures of the thigh the traction splint could be used continuously in case no medical care could be secured But with this kind of splint there is even more need than usual for watching that the splint does not bind too tightly and irritate the part Blueness and coldness of toes and fingers mean that the circulation of a part is suffering and that bandages must be loosened

Dressings on fractures should be changed every three or four days or oftener if bandages become loose or give rise to discomfort With each change the skin should be bathed with alcohol and any reddened parts powdered with borated talcum and more efficiently padded While the splint is temporarily removed assistants should exert a steady pull on the limb to keep it on the stretch After the tenth day gentle massage of muscles about the fracture should be begun During the third week the doctor begins *passive motion* to neighboring joints moving joints such as the knee or elbow gradually without effort on the patient s part These movements are slowly increased until joints move freely Massage and passive motion should be continued daily from the third week until two weeks after splint is removed Most fractures heal completely within six weeks

Heat Exhaustion Heatstroke or Sunstroke and Heat Cramps Follow treatment recommended in the first aid handbook *Heat exhaustion* is not a dangerous condition and is easily treated by having the patient lie down in a comfortable place covering him if he feels chilly and giving him a stimulant such as aromatic spirits of ammonia or hot tea or coffee and also a tablespoonful of salt a little at a time *Heat stroke* and *sunstroke* on the other hand are often fatal The body temperature may rise to 107 or even 110 and unconsciousness become so complete that the patient cannot be roused It is very urgent to lower the temperature by wrapping the patient in a sheet on which cold water is poured applying ice bags

to the head and other parts of the body placing the patient in a cool bath to which ice is added or even giving an enema of ice water When rectal temperature falls below 103° cold should be removed to be returned if the fever mounts again Weakening of the pulse and blueness of the lips and face indicate that cold applications should be removed In such a case the limbs should be rubbed toward the heart and the body wrapped in a light dry blanket Before the patient becomes unconscious he may be given salt with water as in heat exhaustion

Burns Follow treatment recommended in the first aid handbook Deep burns produce scars and scar tissue always tends to contract As a result deep burns on the inner side of joints are almost always sure to cause deformity unless a splint is applied to keep the part extended Thus on the palm surface of *the hands or fingers on the under side of the knee or the inside* of the elbow joint a splint should be placed over the dressing

Wounds Follow treatment recommended in the first aid handbook When a doctor cannot be secured at once apply tincture of zephiran or 2 per cent tincture of iodine to the wound Apply a sterile dressing after this has dried Sterile dressings must always be ready for times of need

Several methods of *home sterilization* are effective Packages of dressings wrapped in muslin may be sterilized for an hour in a pressure cooker Or they may be placed with a potato in a hot oven and left until the potato is done In an emergency clean muslin may be used after being scorched with a hot iron

In serious wounds and burns most doctors now give penicillin or sulfa drugs to *prevent* infection This together with intravenous injection of plasma or transfusion of blood is often the measure on which life depends

Dangerous germs entering wounds or taken into the uterus *at time of childbirth may get into the* blood in overwhelming numbers causing *septicemia* or *blood poisoning* This gives rise to chills high irregular fever and drenching sweats Since malaria causes these same symptoms an attack of malaria occuring after an operation or childbirth is sometimes mistaken for blood poisoning Treatment for malaria would cause symptoms to disappear in such a case In blood poisoning and

in serious local infections penicillin and sulfa drugs save many lives

Boils and carbuncles These result from infection entering the skin where its resistance is impaired as from the friction of a stiff collar or by constant sweating After a long period of hot weather it is common for people to suffer from crops of boils Pus from one boil may soil the clothing and give rise to new infections Carbuncles are more extensive than boils In them pus finally exudes from several openings

Penicillin administered at an early stage may cut short the course of a boil or carbuncle or even a breast abscess but it is not effective applied in dressings locally

First aid treatment of local infection whether resulting from wounds or in the form of boils carbuncles or abscesses of various kinds consists in applying moist heat Six heaping tablespoons of Epsom salt or three heaping tablespoons of salt are dissolved in a quart of hot water This may be used for soaking an infected hand or foot for an hour at a time at intervals of three hours The water should be kept as warm as can be borne In other cases it will be more convenient to apply compresses such as a bath towel wrung out of the hot solution and covered by a hot water bottle Keeping the part elevated will relieve the pain This treatment with moist heat will not only ease suffering but will serve to ripen a boil or abscess so that it will be ready for operation when a doctor finally arrives Or a boil may rupture spontaneously after this treatment

Boils should never be squeezed To do so may force infection through the protective capsule which nature provides into surrounding tissues When a boil has burst cotton wet in alcohol may be used to gently stroke the swelling toward the opening and assist in removal of pus Bathing of the skin surrounding the infection with alcohol on clean cotton may prevent the formation of new boils A sterile dressing should be applied to the infection at least once daily Finally the capsule sometimes called the core of the boil will be discharged After that healing will take place quickly

The hands of the person who treats an infection of this kind must be washed very thoroughly with soap and water both be-

fore and after treatment Preferably sterile rubber gloves should be worn All cotton and dressings soiled with discharges should be burned

The surgical *opening of a boil or an abscess may be indicated* when pain is great or fever present It should not be attempted until one is sure that pus is present If this is the case one part of the swelling is usually more prominent than the rest and by pressing here with the fingers the liquid contents *within are felt to fluctuate The surface is usually reddened* shiny and hot to the touch Only a surgeon should undertake the incision of a deep abscess on the sides of the front of the neck or in the arm pit the groin or other locations where large blood vessels are present

The skin before an operation should be washed with soap and water and then painted with an antiseptic Any instruments to be used should be boiled for ten minutes Unless dry sterile gauze is available boil squares of muslin with the instruments These are for sponging and later for covering the *wound Then carefully pour off the water* leaving the other contents of the pan untouched on its sterile surface Sterile instruments must not be touched until the operator has scrubbed his hands Sterile dressings should be made ready for use after the operation

If rubber gloves are available for the operator these should be wrapped in muslin and weighted down to keep them from floating on the surface of the water in which they are boiled for ten minutes In any case the operator should *scrub his* hands very thoroughly with soap and water and a brush which has been boiled Finger nails should be pared and the spaces under them carefully cleansed before the scrubbing If blue tablets of bichloride of mercury are available a solution of one tablet in a pint of water may be used *for soaking the* hands after the scrubbing

On the extremities particularly in fingers and toes an incision should be made longitudinally rather than across the part In a breast abscess the cut should radiate from the nipple *to avoid cutting across milk ducts*

Rabies or hydrophobia Follow treatment recommended in

the first aid handbook If rabies is suspected the wound should be cauterized with pure carbolic acid followed immediately by 95 per cent alcohol to prevent burning Find out in advance where the nearest facilities for receiving Pasteur treatment are located so that you will be ready in time of need Remember that in bites on the face or when the animal sus pected of being rabid cannot be examined Pasteur treatment should be given at once

Snake Bite Poisonous snakes are common in some parts of the tropics but their bites are not met with so frequently as might be expected As a rule snakes bite only when startled and in self-defense

Those living in snake infested regions should never put a hand or foot into a place not clearly seen Use a searchlight or lantern at night and inspect shoes before you put them on Keep grounds around residences clear of underbrush which might harbor snakes and rid the premises of rats and mice which are a dietary delicacy for them Wear leather boots or puttees when walking through underbrush

Antivenin appropriate for snakes of the region should be kept on hand by the doctor or some other responsible member of the community In liquid form antivenin requires refriger ation but dehydrated products will keep at room temperature Snake bite kits are available with complete instructions for use of the equipment they contain

The bite of a poisonous snake unlike that of a harmless rep tile leaves two puncture marks unless one fang has failed to enter the skin The effect of the venom depends on the variety of snake but in general the poisonous action is on either the nerves or the blood In the former case general symptoms pre dominate and death may result from failing respiration from within an hour to six days after the bite When the action is on the blood violent local reaction occurs with severe pain swelling hemorrhage and sometimes gangrene of the part In fatal cases of this variety death often occurs after six to twelve hours Some venoms have both actions

Follow treatment recommended in the first aid handbook If no regular or improvised suction cup is available the mouth

may be used provided there is no break in its lining membrane If possible the mouth should be washed out afterward with water in which enough potassium permanganate has been dissolved to impart a light red color The old fashioned treatments of rubbing potassium permanganate crystals into the wound or giving the patient whiskey to drink are *not* advised

When a person is bitten by a snake the reptile should be killed and examined as soon as possible to ascertain what kind of antivenin is needed Examination must be cautious since a snake may bite reflexively after death The appropriate antivenin should be injected at the earliest possible moment. Three to five ampules injected into the swelling around the bite with several more injected above the tourniquet may be sufficient Children require larger doses than adults If the patient is getting worse a few more injections may be given

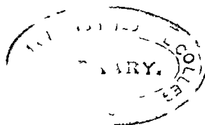
Insect Bites In general these are to be treated by the application of an alkali such as baking soda or ammonia water When suffering is great a teaspoonful of baking soda may be given internally A bee or wasp may leave its sting in the flesh of the victim If this is seen it should be extracted with sterile tweezers

Scorpion Bites These sometimes induce nausea and vomiting sweating and drowsiness as well as local burning pain or simply pain may be the only complaint In some extreme cases death may ensue but victims who survive for three hours usually recover The danger is greatest in the case of infants During the day scorpions lie hidden beneath stones buildings lumber piles and other sheltering objects In houses they may hide in shoes or clothing Fumigation with sulphur is effective against them in the home

Treatment begins with application of a drop of strong ammonia to the bite followed by application of a constricting bandage incision and suction as in snake bite In extreme cases where breathing begins to fail artificial respiration should be performed

The black widow spider's bite is so painful that a dose of morphine is justified A doctor may inject 10 cc of 10 per cent calcium gluconate, intravenously Painful parts may be re

lieved by application of hot wet packs This spider of a shin ing black hue with reddish marks on the underside of its abdomen is found under logs and bridges in cellars and espe cially under privy seats Spraying under seats with creosote is recommended as a preventive measure



[15]

WHEN THE BABY ARRIVES BEFORE THE DOCTOR

THIS CHAPTER is written for the sake of any person who might *have thrust upon him the responsibility of caring for a woman* in childbirth Although normally provisions for the coming of a child are made well in advance with medical care and even hospitalization provided for our best laid plans can still gang agley in such fashion that these services are unavailable at a crucial time

Many animals care for themselves when their young are born Nature having started to bring an infant into the world is very likely to complete the process either with or without human assistance A person with some knowledge of the fundamentals can give a great deal of *help The attendant can comfort* himself with this thought then go ahead and do his best

If the prospective mother has borne children she will know *what to expect Otherwise she should be told* that cramping pains in the back and lower abdomen at regular intervals are likely to occur for a good many hours These pains slight and infrequent in the beginning of labor gradually increase in severity and frequency becoming almost continuous just before the child is born The patient may walk about and assist in preparations for the birth until the pains become hard to bear *Then she should have an enema followed by a warm* sponge bath and recline on the bed

If the patient s pains are severe and close together at the

time of the attendant s arrival he should at once begin steri lizing the most urgently needed supplies Foremost among these are scissors for severing the umbilical cord and four pieces of tape narrow gauze bandage or strips of clean cloth about six inches long for tying the cord These should be placed in a pan of water and boiled for ten minutes Sterile gauze sponges will also be needed and if none are available a dozen six inch squares of clean muslin may be boiled with the other supplies Other provisions must be made for the at tendant to wash and disinfect his hands Two basins soap and a clean nail brush will be needed In one basin an antiseptic solution may be prepared for soaking the hands after they have been scrubbed in the other basin with soap and water The mattress on the bed should be protected by a rubber sheet or other waterproof material beneath the bottom sheet Dur ing the birth of the child some sort of large pads will be needed as further protection Sterile sanitary napkins will also be required for the mother s use after the birth In an emergency any soft clean material may be used

The first stage of labor is that in which the patient is usually able to walk about This stage may last fifteen hours In ex tremely quick labors the child is born a few minutes after the beginning of pains Pains in the first stage are due to the dilat ing of the mouth of the uterus In the course of dilation some blood tinged mucus is discharged and there is likely to be a sudden gush of clear fluid when dilation is complete

The second stage begins with the flood of clear fluid and is also marked by a tendency on the mother s part to bear down as in the act of straining during a difficult bowel movement This stage should be spent in bed Contractions are now more frequent and painful having for their purpose the expulsion of the child The mother can help achieve this by bearing down She should lie on her back with knees up and brace her feet against the bed She may pull on a sheet tied to the foot of the bed Between pains she should rest

A child is normally born head first The attendant will need to watch the progress of the descending head of the child As pains increase in severity and frequency a bulging of the parts

before the child s head will be observed Soon the lips of the genitals separate and the scalp of the infant appears between them The attendant, having scrubbed his hands with soap and water and soaked them for a few minutes in the antiseptic solution should have assistance at this point so that he need not touch *anything except the sterile dressings and in time* the baby and its cord

It is better that the head should not be born too precipi tately *Sitting at the side of the bed* the attendant can *hold the* head back when birth is imminent by pressing upward against the baby s scalp at the height of each pain using a sterile com press Another compress should be used to support and rein force by pressure the thinning layer of flesh in front of the mother s rectum to prevent tearing of the tissues

Finally the head will be entirely expelled The umbilical cord (the cord attached to the baby s navel) is sometimes wrapped about *the child s neck It is* bluish in color and about as thick as a finger It can be loosened with the fingers and slipped over the baby s head When wound so tightly that it *cannot be moved it must be tied at once with pieces of the* sterile tape in two places several inches apart then cut with the sterile scissors between the tapes to prevent its strangling the infant One or more pains after this will *probably result* in expulsion of the entire body The child received into the hands of the attendant will then be wrapped in a sterile towel which has been warmed if the room is cold or in a piece of cotton flannel prepared for the purpose

Immediately after birth the baby should be held upside down by the ankles with one of the attendant s fingers between the feet to prevent slipping The umbilical cord should not become taut during this process While the infant is upside down the head should be bent back and the mouth wiped out with sterile gauze If the baby has not yet cried the skin *over his spine should be rubbed briskly with* a towel If breath ing is still not evident his body should be immersed in a basin of water which tested by elbow feels warmer than the elbow but not hot

After the baby has cried lay him between the mother s legs

for the tying of the cord This is usually done about five minutes after birth or when the cord has ceased to pulsate One piece of tape is tied tightly about the cord two inches from the baby's navel using a square knot A second piece is tied about two inches farther from the child The cord is then cut between the tapes using sterile scissors If either of the cut ends continues to bleed it should be tied again with another piece of tape Apply a sterile dressing surrounding the stump of the cord on the baby and keep it in place with a band about the child's abdomen

At this point if the mother is not in pain drops may be put into the baby's eyes Infection of eyes sometimes occurs during the descent through the birth canal First wash the eyes with boric acid lotion Then one drop of 1 per cent solution of silver nitrate is dropped into each eye As soon as this is done the eyes are to be *washed out again* using several drops of normal salt solution (1 teaspoonful of table salt to an 8-ounce water glass of boiled water) Then wash out with boric lotion again After this care the baby may be put into his bed and his body covered From time to time someone should observe him to see that breathing is normal and that there is no bleeding from the navel

The third stage of labor is still to be accomplished after the baby's birth The placenta commonly called the afterbirth must be expelled This is a large flat fleshy mass with the umbilical cord emerging from near its center and the remnants of the membranous sac attached at its circumference It is often delivered as the result of one contraction of the uterus soon after the birth of the child The third stage is usually over within a half hour but even should it be necessary to wait much longer one must *never pull on the umbilical cord* in an effort to hasten its expulsion Keep the mother warm reassure her and massage the uterus exerting firm downward pressure through the abdominal wall Unless a doctor is expected the placenta may be taken away and buried upon completion of the third stage A doctor would wish to have the placenta kept for his inspection

After expulsion of the placenta the uterus should contract

so that it feels like a hard ball below the level of the mother's navel In the absence of normal contraction it will feel soft and flabby a *condition predisposing to hemorrhage To prevent* excess bleeding press gently on the uterus through the abdominal wall to encourage the uterine muscle to contract A normal amount of bleeding can be expected but when blood pours out in a flood the foot of the bed should be elevated higher than the head and a teaspoonful of fluid extract of ergot diluted with water be given the patient to drink Ergot however should *not* be administered before the afterbirth has been expelled

When the birth is safely over the patient and her bed are to be cleaned up The skin where soiled should be washed with boiled water *A sanitary pad is put in place to receive* discharge from the uterus A folded towel pressing on the top of the uterus through the abdominal wall is held in place by a broad abdominal binder When soiled sheets and nightgown have been replaced *the mother should be covered warmly given* a warm drink and allowed to sleep The sanitary pad is to be inspected occasionally and another teaspoonful of the ergot extract given if bleeding continues too freely During convalescence the sanitary pad is to be changed frequently and external genitals kept clean by washing with boiled water

Aftercare of the child is undertaken when the mother's welfare has been assured Some babies at birth are covered with a cheesy material called the vernix caseosa In many maternity hospitals this is not removed since the child may derive benefit from the coating If the child is soiled with blood the *area involved is cleansed with sterile* mineral oil or vegetable oil

If the baby is bathed soon after birth the stump of the umbilical cord should not come into contact with the water *Sprinkled with boric acid powder it should be surrounded* by dry sterile gauze to prevent its surface from touching the abdominal skin The dressing is changed daily and a band is needed to keep it in place When kept dry and uninfected the cord will drop off after a week leaving a *healthy navel*

In feeding the child warm boiled water should be given

every two hours A nursing bottle medicine dropper or tea spoon may be employed after sterilization When the baby is twelve hours old he is customarily put to the mother s breast for five minutes This is repeated at eighteen and twenty four hours At the end of twenty four hours the child is put on a three hour nursing schedule with water given between feed ings Milk should fill the mother s breasts on the third day

The mother's convalescence should begin with at least a week spent mostly in bed After the first day if she feels well she may go to a near by toilet rather than using a bedpan In bed she should exercise her legs bending and stretching them frequently to favor good circulation She may sit in a chair oc casionally and on the seventh day begin to walk about for short periods taking care to avoid fatigue For several months she must be careful not to lift heavy weights thus stretching weak ened ligaments She should make it a rule to empty the bladder every two hours and avoid lying on the back when the bladder is full

Signs of miscarriage during pregnancy—recurring pains in the lower abdomen or back with perhaps bleeding from the uterus—are an indication that a doctor must be called at once Put the patient to bed Avoid giving laxatives or quinine

After a miscarriage before another pregnancy occurs a physician should study the case to discover the reason for loss of the child and take measures to prevent a repetition

Whenever a child is born to foreign parents in an out-of the way place where there is no doctor to furnish a birth certificate the person who assists in the birth should sign a written statement about the birth This should be registered at the nearest consulate or embassy of the parents nationality at the earliest possible date

SUGGESTED READING

Anita Jones *A Manual for Teaching Midwives* Publication No 260 Children s Bureau U.S Department of Labor Washing ton D C.

Henry L. Woodward and Bernice Gardner *Obstetric Management and Nursing* F A Davis Company Philadelphia 1940

DISEASES OF THE SKIN

SKIN DISEASES are common in the tropics But soap and water cleanliness protection from insects through screening the wearing of shoes and adequate nutrition do much to prevent these diseases Contact with persons and animals suffering from skin eruptions is to be avoided as the sharing of towels with any persons at all Borrowing of slippers bathing suits etc may be the means of contracting a skin disease

Insect bites contact with poisonous or irritating substances such as poison ivy or certain Oriental lacquers and sensitivity or allergy of the individual to certain foods drugs fabrics etc may result in uncomfortable skin conditions Use of DDT or other insecticides and repellents should suffice for control of insects while in cases of contact with an irritant such as poison ivy the affected parts must be cleansed thoroughly with soap and water and a soothing lotion applied When eruptions are due to sensitivity elimination of the offending substance automatically cures the disease For temporary relief of discomfort from allergy the anti histamine drugs such as Benadryl and Pyribenzamine are a great boon particularly in the skin eruption known as hives

In hives (urticaria or nettlerash) the eruption often resembles mosquito bites running together to form large swollen blotches in which itching and burning are intense The eruption may vanish after an hour or two leaving no traces only to reappear in the same or some other part of the body In many cases the attack is caused by some food which has been

eaten Sea food canned goods pork corn and tomatoes are common offenders Treatment should begin with a dose of Epsom salt to clear the digestive tract After this the diet should be liquid at first with soft foods permitted later As a relief for local itching and burning cold compresses of a solution of baking soda may be tried Calamine lotion (with addition of 5 grains of carbolic acid to the ounce) may also be effective But this should not be used on moist or hairy surfaces Starch baths (1 cup of cornstarch in cold water added to the bath) may help

Prickly heat characterized by a fine reddish rash and minute shiny blisters and accompanied by unbearable pricking and itching is the result of almost continuous perspiration The irritation may be due to the presence of a fungus which invades the skin when its resistance is broken down by sweating The use of soap should be discontinued in such a case since it increases irritation Strenuous exercise hot drinks or anything which increases perspiration should be avoided as much as possible Borated talcum powder or a dusting powder of equal parts of zinc oxide boric acid and starch should be used frequently Calamine lotion patted on the parts and allowed to dry may give relief For destroying the fungus diluted vinegar or a lotion of potassium permanganate may be used Sufferers from severe cases should have a vacation from a humid climate or at least provision for sleeping in an air conditioned room This will cause prickly heat to disappear over night.

Acne of a very severe cystic type occurs in some parts of *the tropics In this form pimples develop into cysts filled with* fluid As in other forms of acne general measures for treatment include adherence to a simple diet eliminating chocolate nuts and greasy foods and the application of sulphur in some form such as sulphur ointment until the skin begins to peel Cysts should be opened surgically In extreme cases of cystic acne a change of climate is imperative

Ringworm due to a number of varieties of fungus infection is not infrequent in the tropics *Athlete s foot* perhaps the most common is caused by a fungus which thrives in the

warmth and dampness between toes Floors of public bathing places and showers are particularly dangerous as sources of infection Bathing slippers should be kept on the feet in both places and should be dried aired in the sun and powdered before the next use Spaces between toes must always be dried thoroughly and preferably powdered Desenex powder is particularly effective both in prevention and cure of athlete s foot Irritating ointments such as Whitfield s ointment are suitable only for unirritated dry conditions of scaling and cracking between the toes They should be applied after washing and drying the feet at night and washed off in the morning Then after thorough drying powder should be applied After each week of treatment with ointment powder alone should be used for the succeeding week

For acutely irritated cases of athlete s foot the best treatment is that of soaking the feet in a freshly made solution of potassium permanganate (5 grains to a quart of water) This should be done as continuously as possible for 24 to 36 hours and then 3 or 4 times a day

The shoes and stockings of persons infected with athlete s foot should be disinfected Stockings can be boiled Shoes are best wiped out with a sponge wet in ether Or they may be rinsed out at night with a 5 or 10 per cent solution of formaldehyde and allowed to dry

Ringworm on the surface of the feet or the body may be treated with tincture of iodine unless the part is sore and irritated Toenails infected with ringworm should be scraped with a rough piece of glass or filed to remove as much of the fungus as possible Then they may be soaked in a solution of bichloride of mercury or painted with iodine *Never apply preparations of mercury and iodine together* Such a combination will produce a burn X ray treatment of infected nails gives the best prospect of cure

Dhobie s itch is the name given to ringworm infection supposed to be conveyed through clothing laundered by the dhobie or Indian washerman Red patches with a festooned edge occur in moist parts of the skin such as the armpit and the crotch

The nonirritating sweat acid ointments such as Desenex ointment are excellent for this condition whether acute or chronic Or for acutely irritated conditions dressings soaked in potassium permanganate solution may be used followed by drying and the application of talcum powder Only when there is no irritation should tincture of iodine or Whitfield s ointment diluted with an equal part of vaseline be employed

Some cases thought to be dhobie s itch have proved to be due to contact with the kind of ink used by the dhobie for marking garments

Ringworm of the scalp is common among young boys in the tropics It disappears spontaneously at puberty It is characterized by scaly patches in which there are brittle unhealthy hairs broken off near the roots The hair should be kept short or shaved and should be shampooed once a day with warm water and mild soap Razors combs scissors and towels used become infectious and should not be used by others Treatment by X ray is advised when available Sweat acid ointments are often effective or ammoniated mercury ointment may be applied after loose hairs have been pulled out The infected child should wear a tight fitting muslin cap which can easily be boiled to avoid infecting other children

Impetigo contagiosa is an extremely contagious bacterial infection that often occurs in epidemic form among school children It can be recognized by the honey-colored crusts adhering loosely to the skin Treatment begins with repeated cleansing of the infected part with soap and water removing as much of the crusts as possible After this a fresh solution of penicillin (500 to 1000 Oxford Units in normal saline) applied several times daily gets the best results but this treatment should not be continued for more than a week Ammoniated mercury ointment has long been a stand by for such cases and continues to be useful Ointments containing sulfa drugs are effective but application of these drugs to the skin should be avoided whenever possible because of their frequent sensitizing effects

Tropical ulcers (phagedena) are severe ulcers caused by various kinds of germs They should not be confused with the Oriental sores of leishmaniasis Scratches or insect bites may

permit entrance of infection usually about the ankles or on the front of the shin The first sign of infection is often a blister This ruptures and a large foul smelling sore develops

Treatment includes provision of a nourishing diet rich in vitamins as well as rest and general care of the health When ever possible a change of climate is advised Locally the first problem to be met is the removal of the foul smelling dead tissue on the surface of the sore This may be done by surgical means Dr Paul Harrison after treating large numbers of these ulcers in the humid climate of Maskat Arabia learned that a similar result could be obtained painlessly by applying raw applesauce which he made by mixing dehydrated apple powder with water [1] After being immersed in this mixture for a few days the ulcers became clean Then he applied a dressing wet in cod liver oil and held tightly in place by an adhesive elastic bandage

In small ulcers it is sometimes effective to strap the affected part with adhesive plaster applied directly to the ulcer After five days the plaster is pulled off and much of the dead tissue comes with it

Wet dressings of penicillin as directed in treatment of im petigo are recommended for tropical ulcer Lotions of potas sium permanganate or a 5 per cent copper sulfate solution have also been used with success Sulfa ointments may be used as a last resort

Veld sore (desert sore) is usually caused by infection with the diphtheria bacillus A blister forms and ruptures leaving a raw tender surface In the chronic stage the ulcer is round bluish with thickened margins and a punched out appear ance After a few weeks local paralysis of near by muscles may be noticed When possible a physician will inject 4000 units of antidiphtheria serum in the vicinity of the sores Wet dress ings of penicillin solution are effective in addition to this and sulfanilamide powder may be used as an alternate choice

Scabies or itch is common where people must live crowded together and without facilities for personal cleanliness The disease is extremely contagious and can be transmitted by con

[1] Paul W Harrison M D *Doctor in Arabia* (The John Day Company)

tact with towels bedding or clothing used by infected persons The itching is caused by a female mite just visible to the eye which burrows into the skin forming a tunnel in which to lay its eggs. Itching usually begins about one hour after retiring at night and is largely confined to the front part of the body Diagnosis is confirmed by examination of the webs between the fingers where the mite s presence is indicated by short dirty looking marks each ending in a blister the size of a pin head Such burrows can be seen also on the backs of the hands the elbows the breast or about the groin or genitals

In treatment the affected person should soak himself in a hot bath and then scrub the skin with soap and water employ ing a stiff nail brush to lay open the burrows After this an emulsion containing 25 to 35 per cent of benzyl benzoate is the best remedy This is to be rubbed or painted all over the skin excepting the face After ten minutes the application is repeated The medication should remain on the skin for 12 hours and then be washed off One treatment should be suffi cient

The old fashioned treatment of scabies with 10 per cent sul fur ointment is still used in some cases After the scrubbing and soaking described sulfur ointment is rubbed into the skin for a period of o minutes This is done three nights in succession

Clothing and bedclothes used by a person with scabies should be sterilized by boiling or by steam

Lice (pediculi) are of three varieties the head louse the body louse and the crab louse *Head lice* are usually discovered because of itching of the scalp irritation of the back of the neck or swelling of the rear neck glands Ten per cent DDT in powder applied to the scalp every ten days is an effective remedy If the old fashioned remedy of kerosene is used for application to the scalp it should be diluted with an equal part of olive oil to prevent irritation Fire hazards should also be remembered

Body lice live in the seams of garments Deep parallel scratch marks and small red points caused by bites are seen mostly on the back and shoulders. DDT powder should be applied inside garments with careful attention to the seams

For the skin itself a bath with soap and water is usually sufficient Unless DDT is used all clothing worn in contact with *the skin and all bed sheets must be boiled* for an hour

Crab lice appear like black dots partly buried at the site of hairs in any hairy part of the body except the scalp DDT is very useful in treatment Cuprex is another effective remedy which may be used either for crab lice or head lice All clothing in contact with the infested parts should be boiled for an hour

Chiggers (jiggers or chigoes) of the variety found in tropical parts of Africa and some other countries are reddish brown insects which resemble fleas They attack all warm blooded animals but only the pregnant female burrows under the skin *where it then enlarges to the size of a pea Pus forms* the skin ulcerates and the chigger is finally expelled leaving a sore which may become seriously infected From one chigger to several hundred may be present at a time The feet are most commonly affected but other parts of the body may be involved Prevention consists of keeping dwellings and places where live stock and poultry are housed free from accumulations of dust and dirt After thorough sweeping these places may be sprinkled with a solution of carbolic acid naphthaline powdered tobacco DDT or other insecticides Pigs and other infested animals should not be kept in the vicinity of dwellings Before pitching camp sweep and spray the ground with insecticide

For personal protection the repellents dimethyl phthalate or dibutyl phthalate may be applied to the feet Or the toes *may be annointed with vaseline to which lysol or cresol* has been added in the proportion of 5 drops to the ounce When chiggers have penetrated the skin they should be removed as soon as possible Touching the chigger [illegible] d cigarette or match facilitate removal Ch[illegible]
using two blunt safe[illegible] the [illegible]
the skin from the [illegible] er than [illegible] of
antiseptic may be ap[illegible] or if [illegible]
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such as [illegible] of

Infestation by maggots in wounds or other accessible parts may be treated by applying 5 to 10 per cent chloroform in olive oil for 30 minutes then irrigating the part with salt solution (1 teaspoonful of salt to a cup of water) When a maggot occupies a swelling like a boil do not try to force it out by squeezing place a piece of fresh adhesive plaster over the opening at the apex of the swelling Threatened with suffocation the maggot will emerge to breathe

Creeping eruption is caused by certain worms which burrow under the skin producing a red line which advances a little further every day Freezing the spot with carbon dioxide snow or ethyl chloride spray or the application of an electric needle will kill the worm

Leeches are encountered either in the water of ponds or sluggish streams or clinging to grass or leaves in jungle or grass lands They attach themselves to the victim and suck his blood Prolonged bleeding or infection may result The bite is painless and may not be noticed Repellents such as 612 and dimethyl phthalate are effective for prevention When you are walking through forests high boots or close fitting leggings offer some protection An attached leech can be removed by applying salt vinegar or tincture of iodine to its body or holding a lighted cigarette or match near its posterior end

lids must be inverted and their lining examined Hands must be washed immediately after this procedure

In early stages of trachoma the mucous membrane lining the lids instead of being normally smooth and glistening is thick and velvety looking with sometimes a granular or pebbled appearance Later translucent follicles like small grains of cooked sago or tapioca may stand out from the general surface These irritate the eye Pus may form due to secondary infection In chronic cases scar tissue on the lining of the lids contracts causing the eyelashes to scrape the eyeball This often leads to blindness An operation is indicated

Treatment of trachoma by a physician may include a sulfa drug given internally This will often kill the virus responsible for the disease Or an ointment of 1 per cent sulfadiazine in vaseline may be applied to lids 2 or 3 times a day

A useful remedy for swabbing the lids may be made by dissolving 5 grains of bichloride of mercury in half an ounce of distilled water and adding this to 2½ ounces of glycerine The upper lid is to be inverted over a stick or pencil and the mixture applied to its entire lining by means of cotton twisted on a stick If the lining of the lower lid is granular it too should be treated Between the daily swabbings an eye lotion of bichloride of mercury (in 1 5000 solution) should be used several times a day This drug is of course very poisonous and not to be made available for irresponsible persons who might use it by mouth

Conjunctivitis is inflammation of the conjunctiva the delicate membrane covering the surface of the eyeball as well as lining the lids It is indicated by redness and a discharge which often contains pus One of the best known forms is pink eye This is extremely contagious

Mild conjunctitis may be called a cold in the eye It may be due to exposure to dust For this usually frequent washing of the eye with drops of boric lotion will be sufficient treatment

For pink eye and some other forms of conjunctivitis an effective eye lotion is made by adding 1 or 2 grains of zinc sulphate to an ounce of distilled water

Severe conjunctivitis with pus formation may be treated with 1 or 2 drops of 10 per cent argyrol solution once a day This needs to be fresh Lunargen a similar medication comes in capsules which provide a fresh solution for each time of need (See appendix C)

Severe cases of conjunctivitis are very common in the tropics Greatly swollen painful eyes filled with pus are an every day sight Many cases are due to infection by flies especially in countries where there is a season for eye flies In some instances the inflammation may be due to germs of gonorrhea conveyed either by fingers contaminated with discharge from an infected person or in ophthalmia of the new born from contact of the infant s eyes with an infected birth canal

In severe infections the eyelids often become glued together with pus Unless the examiner is very careful when separating the lids he may be hit in the eye by a stream of the discharge In other cases the conjunctiva of the lids becomes so swollen and inflamed that the eyelids become inverted and appear like fiery red plums lying on the face at the site of the eyes

A patient with severe conjunctivitis is really ill He should stay in bed be seen by a doctor as soon as possible and receive careful nursing

Preparation for nursing care of eye infections should receive adequate thought The attendant must avoid infecting his own eyes the eyes of others with whom he may have contact and the patient s healthy eye in case only one eye is affected It will help him to have things conveniently arranged Not far from the patient s bed or the place of treatment should be facilities for washing the hands soap and water a nail brush and a supply of paper towels or other small towels which can easily be boiled after use If rubber gloves are not available there should also be a basin containing a solution of bichloride of mercury in which to soak the hands after thorough scrubbing

It will be convenient to have all bottles and other objects used in the treatments arranged on a tray to be kept near at hand and covered with a clean towel when not in use Patented all glass drop-bottles which prevent the necessity for using

medicine droppers are convenient for containing lotions and eye drops If droppers are to be used they should be boiled before and after use and kept in a sterile container Glass jars with covers such as those in which mayonnaise is purchased make convenient receptacles They can be placed in a kettle of cold water boiled for ten minutes and then allowed to dry by evaporation Other jars of this sort can be used for small balls or pledgets of absorbent cotton and sticks on which cotton has been twisted for use as swabs A pair of long forceps (or a fork) to be used for removing these articles from the jars should be sterilized and then kept in a tall jar with its blades (or prongs) immersed in 70 per cent alcohol If a kidney basin is obtainable it should also be kept on the tray The patient can hold it against his cheek to catch the overflow when an eye is irrigated This basin should be boiled after use for infective cases For receiving soiled cotton and swabs a waste basket lined with a paper bag should be kept near the bed Contents are to be burned with the bag avoiding con tact of infective material with the fingers

Dangerous infections of the eye often begin very suddenly and without warning Travelers expecting to live beyond the range of prompt medical assistance need to be prepared for emergencies of this kind Intelligent faithful care by a lay attendant while waiting for a doctor to arrive can do much to save eyes whose eyesight might otherwise be lost

In the first place pus forming in an eye should be washed out as quickly as possible Adult patients can if necessary be taught to help themselves in this respect if a bowl of eye lotion and a supply of small balls of absorbent cotton together with a receptacle for soiled cotton and facilities for washing and disinfecting the hands are placed within their reach Warm boric acid lotion bichloride of mercury lotion (1 5000) salt solution (one teaspoonful of table salt dissolved in a pint of water) or even plain warm boiled water may be used for this purpose A minimum of six such cleansings should be *given in a day A fresh piece of cotton should* be used for wip ing each infected eye

Whenever possible patients with severe eye infections

should be kept in bed and isolated If only one eye is infected great care must be taken not *to infect the other one* The patient should be instructed to sleep on the affected side

To reduce swelling compresses wet in cold boric lotion or water may be applied for an hour several times a day Or the doctor may prescribe hot applications Instead of argyrol he may place a drop of 1 per cent solution of silver nitrate in each eye *To prevent the lids from sticking together boric ointment* may be applied to their edges and inner surfaces

Corneal ulcers must be suspected when inflammation in *the eye is accompanied by pain and fear of light If an ulcer is* present it is very difficult to inspect the eyeball because of painful spasm when it is attempted to open the eye The doctor may *apply a drop of atropine solution inside the eye to relieve* spasm and pain and make inspection possible The ulcer is seen as an opaque spot which appears less shiny than the rest of the surface of the colored part of the eye The use of atropine especially in persons over forty years of age may in a few cases precipitate glaucoma commonly known as hardening of the eyeball *It is very urgent that a physician be found to* deal with cases of ulcer The treatment then can be left to him But ulcers may spread rapidly and result in blindness In *out-of the way places where medical help is not available* if it is impossible to examine or treat the eye because of pain and spasm it may be permissible for the lay worker to apply one drop of 1 per cent solution of atropine inside the eye and follow this after the eye can be inspected by one drop of 1 per cent silver nitrate solution to be washed out afterward with salt solution and boric lotion as described Atropine dilates the pupil and produces temporary blurring of the vision If the attendant accidentally gets it into his own eye it will have this effect



[18]

MALARIA AND BLACKWATER FEVER

MALARIA

MALARIA is a disease characterized by periodic attacks of fever accompanied by anemia and enlargement of the spleen It is at present the greatest disease problem and the chief cause of death throughout the world It is found practically every where except in the frigid zone but its frequency and viru lence increase as the equator is approached

CAUSE

MALARIA is due to infection with malaria parasites trans mitted by the bite of female anopheles mosquitoes In general this mosquito differs from other varieties in that it has spotted wings and a straight body which forms an angle of 45 with the surface on which it rests Of 160 known species of anophe lines at least 30 have been found to transmit malaria For the complete life cycle of the parasite of human malaria both a human being and an anopheles mosquito are necessary In fection can however be transferred from one human being to another by transfusion of blood or the use of a hypodermic needle contaminated with the blood of an infected person

The degree of malaria in a community can be estimated by two methods

1 The *parasitic index* Persons trained in microscopic diagnosis of malaria can form an estimate of the extent to which a community is infected by examining the blood of a large number of the inhabitants Many adults who have no

symptoms may be found to harbor the disease The percentage figure showing the proportion of specimens containing para sites in relation to the total number examined is the para sitic index

The *splenic index* can be ascertained by lay workers It is obtained by discovering the percentage of native children between the ages of two and ten years who have enlarged spleens With the child standing and taking a deep breath as he faces the examiner the latter inserts his hand beneath the lowest rib on the left side of the abdomen Normally no solid object is felt in this location An enlarged spleen on the other hand gives a feeling of resistance The mass extends a few inches below the rib or even in severe cases seems almost to fill the abdomen

In choosing a place to reside in the tropics the use of the splenic index may be of great practical importance If 50 per cent of children examined in the locality have large spleens the place may be considered extremely malarious and danger ous A rate of 25 to 50 per cent shows the disease to be very prevalent With 10 to 25 per cent of large spleens the disease is moderately prevalent A locality with less than 10 per cent is considered comparatively healthful

PREVENTION

THIS MAY be considered under three headings

1 The extermination of mosquitoes
2 The prevention of infection of people by mosquitoes
3 The prevention of infection of mosquitoes by people

1 *Extermination of mosquitoes*

(*a*) *Elimination of Breeding Places* Information as to the most important measures to be used in any area can be ob tained from the local health officers What is useful in one loca tion may be actually harmful in another place where a differ ent kind of anopheles mosquito transmits malaria Sometimes the indicated measure is to cut down brush and let in sunlight while in other places it is just the opposite i e to provide shade which the local important malarial mosquito cannot endure Drainage is always useful but it is usually expensive

Filling in depressions which collect water is always useful but is more expensive Cleaning vegetation away from the edges of standing or running water is usually advantageous because it removes the shelter of vegetation from anopheles larvae and makes them accessible to their natural enemies

(*b*) *Destruction of Mosquito Larvae* Formerly this was accomplished through the application of either oil or Paris green to the surface of water where mosquitoes breed Now it will usually be possible to employ DDT in diesel oil It is said that the use of two quarts of 5 per cent diesel oil solution of DDT is as effective in killing larvae as 20 to 40 gallons of oil without DDT On a large scale DDT is sometimes dispersed by air plane

Another means of destroying mosquito larvae is by the introduction of small fish which are the natural enemies of larvae Thus gambusia are useful in the rice fields of Egypt Minnows are also found in rice fields and are said to live through the winter in ditches and canals Gold fish destroy larvae in garden ponds

(*c*) *Destruction of Adult Mosquitoes* Insecticide sprays such as those containing pyrethrum have long been so used DDT has an outstanding contribution as an insecticide because of its *long lasting residual effects* Although it acts more slowly than pyrethrum its anti malaria value against adult mosquitoes is enormous in that it kills them before their infection can reach the infective stage An amazing reduction in the incidence of malaria in Panama has been achieved by the spraying of native huts inside and out with DDT three or four *times* a year In this case 400 mg of DDT was employed per square foot of space The mosquitoes apparently rest on the walls of the huts after flight and after biting and absorb the DDT through their feet

In the household DDT can be used in emulsion form to spray walls screens of doors and windows and to impregnate netting used for bed curtains Mosquito bombs containing DDT will be useful on occasion

2 *Prevention of infection of people* by mosquitoes *This is* accomplished by

(a) Screening of houses or *at least* of sleeping rooms

(b) Use of bed nets

(c) *Use of repellents such as the 6–2–2 mixture* as explained in chapter 8

(d) Protective clothing for those who must be outside screened houses at night Mosquito boots long trousers and sleeves gloves and headnets are recommended

3 *Prevention of infection of mosquitoes* by people is achieved chiefly by having all infected persons sleep under nets Don t infect the mosquito and the mosquito can t infect you

What Is Suppressive Treatment?

Suppressive treatment although sometimes called prophylaxis *is not a true preventive No drug known at present is* able to kill the malaria organism as soon as it is injected by a mosquito But malaria can be *suppressed* so that no symptoms occur During World War II atabrine was the drug employed to keep armed forces free of symptoms Formerly quinine had been used Newer drugs are now replacing atabrine which is a dye and imparts a yellow color to the skin

Should those who plan to live for years in a malarious locality begin on arrival or before arrival to take medicine for suppressive treatment?

Doctors disagree on this subject Residents who have the advantage of medical supervision should defer to their doctors judgment in this matter For any lay persons who must take the responsibility for preventing illness in a malarious locality the following plans for suppressive treatment are given Treatment may be started two weeks before exposure is anticipated and should be continued for at least a month after leaving the district

SUPPRESSIVE TREATMENT WITH ARALEN (CHLOROQUINE)

(See Appendix C)

Tablets contain 0 25 gram (base 0 15 gram)

ADULTS

2 tablets (0 5 gram) *once a week continuously on the same day of the week if in a highly malarious area*

CHILDREN *(according to age)*

0–1 year	¼ tablet	(0 06? gram [1 grain])
1–3 years	½	*(0 125 gram [2 grains])*
3–6 years	¾	(0 18 gram [3 grains])
6–10 years	1	*(0 25 gram [4 grains])*
10–14 years	1½	(0 375 gram [5 grains])

The dose indicated in the above table is to be given once a week i e for an infant ¼ tablet once a week for a child of 8 years *1 tablet weekly*

SUPPRESSIVE TREATMENT WITH PALUDRINE OR GUANATOL

(*See* Appendix C)

ADULTS

1 tablet containing 0 1 gram (1½ grain) twice a week 3–4 days apart—continuously or during the malarial season If this does not prove effective take one tablet on alternate days or even daily

CHILDREN

Use tablets containing only 25 or 50 milligrams

0–1 year	½ of a 25 mgm tablet *twice* a week	
1–3 years	1	25 mgm tablet *twice* a week
3–6 years	1½	25 mgm tablet *twice* a week
6–9 years	1	50 mgm tablet *twice* a week
9–12 years	1½	50 mgm tablet *twice* a week
Over 12 years	1	100 mgm (0 1 gram) tablet *twice* a week

SUPPRESSIVE TREATMENT WITH ATABRINE (*QUINACRINE*)

ADULTS

0 1 gram (1½ grains) daily

CHILDREN *(according to age)*

0– years	0 0 5 gram (½ grain) every second day
3–8 years	0 0 5 gram (½ grain) daily
8–15 years	0 05 gram (1 grain) daily

15 years or over adult dose

SUPPRESSIVE TREATMENT WITH QUININE

ADULTS

0.32 gram (5 grains) daily

CHILDREN *(according to age)*

Less than 1 year	0.017 gram (1/4 grain) daily
1 year	0.032 gram (1/2 grain) daily
2 years	0.065 gram (1 grain) daily
3–4 years	0.125 gram (grains) daily
5–7 years	0.2 gram (3 grains) daily
8–10 years	0.25 gram (4 grains) daily
10 years or over	adult dose

Instead of quinine for suppressive treatment in children it is the custom in some places to administer a daily dose of euquinine (quinine ethyl carbonate) a powder containing 59 per cent of quinine alkaloid This is preferred by some because of its less bitter taste It is often administered mixed with jam or honey The dose is the same as that of quinine or a little larger

The Role of Health Education in Preventing Malaria

Cooperation of the general population is greatly to be desired in the project of freeing any community from malaria The extreme poverty of many of the inhabitants of countries where malaria is common interferes to a discouraging degree however with results of health education It should be the aim to have every person sleep under a bed net but often this is impossible and all that can be hoped for is to produce intelligent cooperation with government agencies whose business is the eradication or oiling of standing water spraying of houses and vehicles and other public health measures The cinema is a useful means of disseminating information to both adults and children[2]

[2] Walt Disney's film on malaria called *Winged Scourge* can be obtained from the Institute of Inter American Affairs Washington D.C.

TYPES OF MALARIA

MALARIA is either benign or malignant

Benign types are (1) benign tertian malaria a common form due to the Plasmodium vivax whose symptoms often but not always occur every third day (i e at intervals of forty-eight hours) (2) quartan malaria due to the Plasmodium malariae whose symptoms occur every fourth day and (3) malaria due to the Plasmodium ovale a less common type whose symptoms occur every forty eight hours

The *malignant* form of malaria due to the Plasmodium falciparum is called malignant tertian subtertian or aestivo autumnal malaria It has a cycle of about forty-eight hours but is often irregular

It is not always possible to distinguish types of malaria by the intervals at which symptoms occur The patient may have been infected more than once with the same or different kinds of parasite Fever is called remittent when paroxysms overlap and fever occurs every day or intermittent when free intervals occur

Benign tertian malaria although not usually dangerous to life is very difficult to cure and usually relapses Malignant malaria although more dangerous to life if untreated can usually be cured by the treatments to be outlined

Persons accustomed to relapses of malaria should for years always take anti malaria medicine with them when traveling They can recognize the beginning of symptoms and take the medicine at once

SYMPTOMS

SYMPTOMS of malaria are often misleading The first attack of the benign type is often far from typical Fever may be continuous A relapse may simulate anything from acute appendicitis to lobar pneumonia Persons accustomed to relapses should never be without anti malaria medicine They should take this when unable to secure medical advice no matter what their symptoms are And no matter what other disease is present malaria is always likely to be a complicating factor

Symptoms of a Typical Attack of Benign Tertian Malaria

In this the most common and mildest type there are in typical cases three stages of symptoms

1 Cold stage (duration ½ to 2 hours) This stage may be preceded by a headache a tired feeling lack of appetite and muscular pains In other cases a violent chill begins abruptly The teeth chatter the body shakes the bed the skin is dusky and cold goose flesh appears and the lips are blue and the features pinched In spite of coldness of the surface the temperature may rise to 104–105° in this stage Headache and vomiting are common

2 *Hot stage* (duration 3 to 5 hours) The sensation of coldness gradually gives way to one of warmth followed by intense heat Fever may reach 106 The pulse is full and fast Fever blisters sometimes occur on the lips The patient suffers from restlessness headache muscular pains and thirst There may be slight delirium

3 *Sweating stage* (duration 1 to 2 hours) Now the temperature falls Sweating is profuse Pains disappear and thirst abates The patient falls into a refreshing sleep After he awakes he may go about his work as usual feeling perhaps a little languid

Enlargement of the spleen The spleen is almost always enlarged during the chill Tenderness over the region of the spleen is usually present during the stage of fever After many attacks the spleen remains large This condition is called ague cake

Symptoms in small children are often atypical Convulsions may take the place of a chill and sweating may be absent There may be diarrhea and vomiting

Symptoms of Malignant Malaria

These are more severe than those of other types Fever may last for more than twenty four hours without a break It may begin in the late afternoon and continue throughout the following day

The chill is less marked than in the other types Severe di

gestive disturbances sometimes occur and anemia and emaciation may be extreme

Pernicious Malaria

This term refers to special and very dangerous manifestations of malaria which are usually but not always due to infection with the malignant parasite Various types of symptoms occur according to the part of the body in which the parasites lodge

1 *The gastro intestinal form* is sometimes mistaken for cholera food poisoning gall bladder disease appendicitis or ruptured ulcer of the stomach There may be pain diarrhea and vomiting Blood is sometimes vomited or passed from the rectum The disease may resemble bacillary dysentery

2 *The cerebral form* in which parasites lodge in the brain causes severe headache drowsiness and unconsciousness from which the patient cannot be aroused There may be vomiting Paralysis may also occur

3 *The algid type* is one in which infection is so overwhelming that the patient dies after six or eight hours without fever having occurred The temperature may even be subnormal The surface of the body is cold and clammy the eyes are sunken and collapse is profound

4 Other pernicious types may simulate pneumonia kidney disease or almost any kind of serious illness

Latent Malaria

This term describes a condition in which parasites live in the body for a long time without producing symptoms Eventually symptoms may be precipitated by fatigue cold and wet injury operation or childbirth Chills and fever from this cause occurring after operation or childbirth are sometimes mistaken for blood poisoning A person who has for a long time been free of symptoms of malaria while living in the tropics is likely to have an attack of fever after reaching a cooler climate

Very severe anemia may result from destruction of red blood cells by malaria parasites In some cases the patient has not been known to be suffering from malaria This anemia calls

for treatment with iron Extremely anemic patients should move away from the malarial district With appropriate treat ment they may recover

TREATMENT OF MALARIA

1 *Put the patient to bed* as soon as he feels chilly prefer ably before actual shivering begins Supply hot water bottles and hot drinks and cover him warmly

2 *Secure a diagnosis* If it is at all possible to secure medical help wait for the doctor to take a specimen of blood for ex amination before giving any anti malaria drug In some places where medical service is not quickly available lay persons can be taught to make a spread from a drop of blood taken from the finger or the lobe of the ear Two glass slides should be prepared in this way and put aside until their examination is possible If anti malaria medicine has been given *before* the spreads are made laboratory tests will probably be useless since all the malaria parasites will have disappeared from the blood

3 *If no medical help for diagnosis and treatment can be secured and the patient is thought to have malaria begin treat ment with an anti malaria drug as soon as possible* The other anti malaria drugs are to be preferred to quinine for the pregnant and those who for some reason cannot take quinine

TREATMENT OF ACUTE ATTACKS OF MALARIA WITH ARALEN

(See Appendix G)

ADULTS

Single dose is 2 tablets each containing 0 25 gram (base 0 15)

Course 4 tablets taken at once
2 tablets 6 hours later
2 tablets daily for 2 days
Total 10 tablets taken within 3 days (2 5 grams)

CHILDREN

0–1 year Initial dose 1 tablet (0 25 gram) followed by 1 tablet (0 25 gram) 6 hours later Total 0 50 gram

2–5 years Initial dose 2 tablets (0 50 gram) followed by 1 tablet (0 25 gram) 8 hours later Total 0 75 gram

6–10 years Initial dose 2 tablets (0·50 gram) plus two doses of 1 tablet with 8 hour interval Total 1·0 gram

11–15 years Initial dose 3 tablets (0·75 gram) followed by 1 tablet (0·25 gram) 8 hours later and 1 tablet (0·25 gram) 24 hours later Total 1·25 gram

TREATMENT OF ACUTE ATTACKS OF MALARIA WITH PALUDRINE OR GUANATOL

(See Appendix C)

ADULTS

If the infection is known to be due to *malignant (Falciparum) parasites* a single dose of 3 tablets (0·1 gram each) will abort an attack For radical cure 1 tablet (0·1 gram) three times a day for 10 days or twice a day for 14 days In *benign tertian malaria (Vivax)* a single dose of 3 tablets will bring the temperature to normal and relapses may be prevented by taking 1 tablet (0·1 gram) twice a week 3 or 4 days apart

The *best course when the type of infection is unknown* is to take 1 tablet 3 times a day for 10 days then 1 tablet twice a week for 3 months

CHILDREN (*based on* apparent *age*)

0–1 year	½ of a 25 mgm (0·025 gram) tablet twice a day	
1–3 years	1	25 mgm tablet twice a day
3–6 years	1	25 mgm tablet 3 times a day
6–9 years	1	50 mgm tablet twice a day
9–12 years	1	50 mgm tablet 3 times a day
12–15 years	1	100 mgm tablet twice a day
Over 15 years	1	100 mgm tablet 3 times a day

If necessary the larger tablets may be cut in sections of a quarter or a half to secure the approximate dose indicated Using these doses appropriate for the age the course should be given as in the case of adults

TREATMENT OF MALARIA WITH ATABRINE

ADULTS

2 tablets (each 0·1 gram or 1½ grains) thrice daily *after meals* for 2 days

After this 1 tablet thrice daily *after meals* for 5 days When the drug causes digestive disturbance each dose may be accompanied by ¼ teaspoonful of bicarbonate of soda (baking soda) Atabrine should never be given on an empty stomach

CHILDREN

For young children tablets should be crushed and combined with syrup or honey

Up to 1 year	¼ tablet (0 025 gram or 3/8 grain) twice daily for 5 days
1–4 years	1/ tablet (0 05 gram or ¾ grain) twice daily for 5 days
4–8 years	1 tablet (0 1 gram or 1 1/ grain) twice daily for 5 days
8–12 years	1 tablet (0 1 gram or 1 1/ grain) thrice daily for 5 days

12 years or over adult dose

TREATMENT OF MALARIA WITH QUININE

ADULTS

Of quinine sulphate[1] or the soluble bihydrochloride 10 grains in either uncoated tablets capsules or solution thrice daily for 3 days Then 10 grains twice daily for a week After this 10 grains once daily for 3 weeks

CHILDREN

Under 1 year approximately 1/10 the adult dose
1–2 years 1/8 the adult dose
2–6 years ¼ the adult dose
6–12 years 1/ the adult dose
12 years or over adult dose

The Intravenous Injection of Quinine For serious illness with malaria and especially in case of pernicious types of the disease a physician may inject quinine bihydrochloride intravenously

The Intramuscular Injection of Quinine The possibility of injecting quinine intramuscularly should be mentioned This method is far inferior to use of the intravenous route Occasionally it gives rise to considerable soreness or even abscess formation at the site of injection Nevertheless in the hands of an attendant who is unable to give intravenous injections it may be the means of saving lives When a patient is very ill with malaria and cannot take quinine by mouth or receive it

[1] O e drop of concentrated hydrochloric aci l will cause 5 grains of qu ine sulph te to dissolve in a tea poonful of water

by intravenous injection 10 grains of quinine bihydrochloride in the form of tablets especially prepared for injection may be dissolved in 5 cc of boiled water and injected into the buttock The upper outer quadrant of the buttock is the preferred location The syringe should be boiled before use and the skin painted with an antiseptic After the injection the tissues should be massaged gently to promote absorption Injections may be made into the two buttocks alternately 1 to 3 times a day according to the urgency of the patient s condition As soon as medicines can be taken by mouth injections should be discontinued

Quinine, Given by Enema When no other way of administering quinine is possible it may be injected into the re tum A lay person could use the following directions

After a cleansing enema an adult may be given 2 grams (30 grains) of quinine in solution (preferably the bihydrochloride) diluted with 3–10 ounces of liquid starch prepared as follows

Mix one teaspoonful of laundry starch with a little cold water Stir until smooth Then add hot water until mucilage is formed The mixture should be introduced as high into the rectum as possible using a tube or catheter instead of a nozzle The patient should be kept quiet with the hips elevated on a pillow to prevent expulsion of the liquid

Quinine by enema is useful in treating children suffering from convulsions due to malaria A dose of 0 3 gram (5 grains) in an ounce of liquid starch may be given to a child of one year The buttocks should be pressed together afterward to prevent expulsion of the medication Injections of the same strength may if necessary be repeated at hourly intervals until convulsions cease

Undesirable Effects of Quinine Medication Large doses of quinine often cause ringing in the ears and blurring of vision These are not of serious import Indigestion vomiting or a skin eruption may occur in patients sensitive to the drug In the pregnant quinine has been thought to bring on miscarriage But malaria *must* be treated in the pregnant and with care quinine may safely be given when other drugs are not available The following plan of *desensitizing* a patient

who for some reason finds it difficult to take quinine has been found useful in India

Desensitizing doses of quinine Begin with $1/10$ grain of quinine combined with $1/3$ teaspoonful of baking soda Half an hour later give $_{10}$ grain likewise combined with soda Continue giving quinine and soda every half hour doubling the amount of quinine each time until the normal dose is tolerated

1 *General treatment of malaria* Good nursing is very important throughout serious attacks of malaria There should be rest in bed and constant supervision Patients with a high temperature sometimes become maniacal and attempt suicide

Besides the use of anti malarial drugs other measures should be taken to *lower the temperature* Cool sponging should be started when the fever reaches 103 If it mounts still higher the patient should be wrapped in a sheet wrung out of tepid water or be lifted into a tub of tepid water which is afterward cooled

For symptomatic treatment of nausea 1/[illegible] teaspoonful of baking soda may be given with a little water and repeated at intervals *Constipation* should be relieved by a laxative The diet should be liquid while there is fever At other times a nourishing convalescent diet is in order After an attack anemia should be treated with iron in medicinal form

BLACKWATER FEVER

BLACKWATER FEVER is a complication of malignant malaria with an average mortality of 25 to 50 per cent The disease gets its name from the fact that the urine assumes a black or dark color due to the presence of hemoglobin the coloring matter of blood Blackwater fever appears only in areas where malignant malaria is common and in people who have been infected for several months Inadequate treatment of malaria seems to be a predisposing factor On the other hand the disease seems not to occur in those who have had serious attacks of malaria accompanied by high fever Anyone who has lived in an infected area may contract the disease but males have proved to be more susceptible than females

PREVENTION

In places where blackwater fever occurs care should be taken to avoid overexertion and exposure to chilling Alcoholic drinks should not be used Symptoms of malaria should not be overlooked or neglected even though they are slight The disease should be promptly and adequately treated Attacks are often brought on by a large dose of quinine taken for a relapse of malaria after a period when treatment has been neglected

The Pre Blackwater State

For the benefit of those who live where blackwater fever is known to occur the following symptoms may give warning of the possible approach of the disease The complexion becomes sallow and the whites of the eyes have a yellow tinge The tongue is heavily coated and constipation is the rule The urine looks darker than usual Both the spleen and liver are enlarged and can be felt in the abdomen below the lowest rib on the left and right side respectively There is usually headache and slight irregular fever

The onset of actual blackwater fever is usually evidenced by a sudden rise in temperature to 103 or even higher The fever may become irregular after this Backache occurs together with other aches and pains There is an urgent desire to void and the urine becomes almost black in color The skin is jaundiced In severe cases there may be vomiting discomfort in the region of the stomach and severe pain over the liver The fever may rise to 104° or higher the urine may become scanty and finally be suppressed altogether Complete suppression of urine is a very unfavorable sign in regard to the prospect of recovery

TREATMENT OF THE PRE BLACKWATER STATE

1 As soon as the temperature rises the patient should be put to bed It is a mistake to go about as usual and especially dangerous to travel Secure a physician at the earliest possible moment

2 The skin should be kept warm and protected from draughts

3 As much fluid as possible should be drunk in order to increase the amount of urine Drinks should be taken warm and in small quantities From this point until well into the convalescent period in case blackwater fever actually develops food should consist only of liquids including fruit juices broths and milk Acid fruit cordials should not be given

4 Every 4 hours give a teaspoonful of baking soda dissolved in water This need not be taken all at once but may be supplied gradually combined with fluids taken

TREATMENT OF BLACKWATER FEVER

1 Careful nursing is exceedingly important The patient becomes very weak before he is able to assimilate food and even the act of sitting up in bed may precipitate heart failure

2 It is very urgent to provide the services of a physician In case no medical advice can be secured continue the fluid diet and the doses of baking soda If the usual liquid foods cannot be retained try barley water and albumin water [*] When the stomach cannot retain any fluids inject a glass full of warm salt solution into the rectum using a teaspoonful of table salt to a glass of boiled water Raise the hips on a pillow to enable the enema to be retained Repeat the injection every half hour or hour

3 If nausea occurs it may sometimes be lessened by holding cracked ice in the mouth Vomiting may be lessened by the application of a mustard plaster or cloths wrung out of very hot water to the pit of the stomach

A physician should decide about the resumption of suppressive treatment after an attack of blackwater fever Other antimalaria drugs are probably safer for this purpose than quinine

[*] Albumin water can be made by adding ½ cup of cold water to the white of an egg with a teaspoon of sugar and the same amount of lemon juice and shaking all together in a tightly closed glass fruit jar

[1 9]

SOME TROPICAL FEVERS OTHER THAN MALARIA

Typhoid Fever

Typhoid fever (enteric fever) a disease associated with ul ceration of the intestine and characterized by fever which lasts about four weeks is found throughout the world This disease and the similar but milder *paratyphoid fevers* are responsible for many cases of prolonged undiagnosed cases of fever in chil dren and adults

The *cause* is the *typhoid bacillus* from the discharges of pa tients or healthy carriers of the disease This contaminates food or drink

Symptoms begin with a period of illness with headache backache and discomfort in the abdomen After this tempera ture begins to rise then fall slightly and rise again higher than before After about a week the fever reaches its highest point and at the end of the third week begins to fall After apparent recovery the patient may have a relapse generally milder than the original attack

Characteristic of the disease is the pulse rate which is usually 20 to 40 beats slower than would be expected with the associ ated degree of temperature The face is flushed and has a dull stuporous appearance Delirium if present is of the low mut tering variety The mouth is dry and the tongue coated in the middle with a clean tip and edges Diarrhea is often present but constipation may take its place or diarrhea and constipa

tion may occur alternately There may be nausea and vomiting and the abdomen may be either bloated or sunken Scattered rose-colored spots often appear on the chest and abdomen coming out in crops seven to ten days after the onset. These are single slightly elevated to the touch and lose their color on pressure

Dreaded *complications* of typhoid fever are (1) perforation of an intestinal ulcer with resulting peritonitis and (2) hemorrhage into the intestine with appearance of black or bright red blood in the stools

Vaccination is the most effective method of *prevention* Destruction of flies use of safe food and drink with handwashing before touching food and before eating are also essential modes of prevention

Treatment The patient should if possible be placed in a modern hospital No cathartic should be used but when necessary an enema of a pint of warm water containing a teaspoonful of salt may be given as an enema Recently Chloromycetin has given promise of exerting a specific effect

At least 7 or 8 pints of fluid should be drunk daily Adequate nutrition is very important Milk is the most valuable single article of food Diluted fruit juices should be given unless they cause distress Soft foods as outlined in chapter 10 are usually well borne Anything hard such as toast should be avoided If hemorrhage takes place food and drink should be stopped for twenty four hours and then resumed gradually Convalescence is lengthy and relapses are frequent

Dengue

Dengue (dandy fever breakbone fever seven-day fever) occurs in rapidly spreading epidemics and is due to a virus conveyed by the bites of mosquitoes chiefly of the Aedes aegypti variety Beginning with a chill followed by a rise of temperature which may reach 106 it produces a deep flushing of the face and a rash which may be seen for an hour or more The head and eyeballs ache and a part or the whole of the body is racked by pain resembling rheumatism Prostration is great and the pulse rate may be 1[illegible]0 or more After a day or two the

temperature becomes normal but on the fourth or seventh day fever and pains return accompanied by a rash which in some ways resembles the rashes of both measles and scarlet fever Rheumatic pains persist sometimes for months and relapses are common A change of climate may be advisable although the disease is never fatal Prevention is through mosquito control

In treatment bed rest may be needed for as long as ten days Chilling should be avoided and a light diet is indicated Aspirin helps in relieving the pain as does local application of oil of wintergreen to the joints Ice water or lemonade should be given frequently during fever and enemas are to be preferred to purgatives to relieve constipation

Sandfly Fever (Pappataci Fever Phlebotomus Fever)

Sandfly fever may occur wherever the sandfly is found It is known as a fever which lasts three days and is never fatal

Symptoms begin about four to seven days after the bite of an infected sandfly A chill is followed by fever The face is flushed the front of the head aches and there is pain and stiffness in the back of the neck Pain occurs also at the back of the eyes which are bloodshot The legs and back ache the tongue is furred and the patient is drowsy but cannot sleep In from twenty four to thirty six hours the temperature reaches 103° or 104° It persists for one more day and then begins to fall At this time nosebleed vomiting sweating and diarrhea may occur At the end of the third day the temperature is usually normal but debility lasts for a week or two

Prevention In regions where the sandfly is prevalent bed nets must have a fine mesh (forty holes to the linear inch) in order to exclude this very small fly Since the insect does not fly very high sleeping on the roof of a house may serve as a protection

Sandflies breed in damp dark places and especially among rubbish and in vines and shrubbery Premises in which repeated cases have occurred may continue to harbor infected sandflies Such buildings should be avoided or made safe by

destroying rubbish and removing broken down walls and shrubbery Cracks should be filled up latrines fumigated with sulphur and dark cellars ventilated and white washed DDT residual spray should be used and animals and fowls kept at a distance from the house

No specific *treatment* is known for sandfly fever but symptoms should be treated as they arise That is high fever may be relieved by sponging and copious amounts of cool drinks with aspirin to relieve the pains When the bite is noticed it should be painted with tincture of iodine

Yellow Fever

Yellow fever (Fievre Jaune Feibre Amarilla Amaryl) is due to a virus conveyed by Aedes aegypti mosquitoes These bite mainly in the daytime but not in bright sun The disease gets its name from the jaundice which sometimes but not always constitutes a prominent symptom The disease is not wide spread Small epidemics have occurred in Africa on the west coast and in the Anglo-Egyptian Sudan In South America the disease exists in jungle areas

Symptoms usually begin with shivering about two to five days after infection The next day temperature may rise as high as 104 Severe headache in the forehead or behind the eyes is accompanied by flushing and swelling of the face with pains in the back legs and abdomen The pulse although as rapid as 100 beats per minute at first either remains stationary or falls and is soft and weak Jaundice appears in typical cases on about the third day and increases throughout the illness The enlarged liver can be felt below the ribs on the right side of the abdomen On the third or fourth day stage of calm begins The temperature falls and other symptoms improve Then either the patient may proceed to get well or he may develop fever again with increasing jaundice and possible hemorrhage from the stomach or nose

About 25 per cent of sufferers from yellow fever die usually on about the sixth day Some cases are so mild that the patient does not go to bed It is said that if the initial fever does not exceed 105 chances for recovery are good

Prevention by vaccination is important Immunization should be repeated every two years Measures should be taken against the mosquito This variety prefers vessels containing water—vases flower pots roof gutters tire casings etc—as breeding places

There is no specific treatment for yellow fever The patient should remain under a mosquito net The bowels should be kept open using a dose of Epsom salts at the beginning of symptoms and enemas afterward Much fluid should be drunk and baking soda in the amount of 1 teaspoonful every 4 hours administered in the fluid In the early stages citrus fruit juice only should be given as food Later light starchy foods may be given but very little fat

Kala Azar

Kala azar (visceral leishmaniasis dum dum fever or sahib s disease) which resembles chronic malaria is characterized by irregular fever enlargement of the spleen and liver with bleeding from nose and gums and severe anemia It is due to a microscopic parasite (Leishmania) probably conveyed by sandflies Six weeks to four months after the infecting bite the onset of the disease may be either sudden or gradual with high fever ushered in by a chill and vomiting After two to six weeks the fever may go away only to return later recurring for months Profuse sweats are common and later there may be swelling of the ankles and legs The skin may assume an earthy gray color

Without specific treatment 90 per cent of patients die within two and one half years Manson Bahr says The outstanding clinical feature which impresses itself on one s mind is that in spite of the patient s weak and emaciated condition—he preserves a good appetite and a clean tongue while with a temperature of 102 degrees he may be doing his work and be quite unaware that he has fever In this respect kala azar differs from malaria and other toxic fevers such as typhoid

Intravenous injection of antimony compounds is usually effective in treatment The pentavalent preparations of antimony including neostibosan and urea stibamine are now

used in preference to the trivalent tartar emetic for the purpose

Relapsing Fever

Relapsing fever (also known as tick fever louse fever famine fever or spirochaetal fever) is the term applied to a group of diseases conveyed by lice or ticks Louse borne relapsing fever occurs in parts of Europe and Asia especially China and North Africa Tick borne varieties of the disease are found in Central Africa among other places The soft tick responsible for relapsing fever in Central Africa is an oval rotund greenish brown animal which is one third inch or less in length and has a leathery surface Its habits are similar to those of bedbugs

Relapsing fever in general is characterized by a period of fever lasting two to six days and followed after apparent recovery by one or more relapses Without microscopic examination of the blood for the spirochete causing this disease diagnosis is difficult A high prostrating fever which relapses about fourteen days after the beginning of symptoms however is suggestive of relapsing fever

Prevention is most effectively accomplished by use of DDT in talcum powder applied on the person and on the inside of clothing Insect repellents are also excellent Other means for prevention include the avoidance of infected areas such as old camp sites and native houses in places where the disease is prevalent Bed nets and beds raised above the floor on smooth legs which ticks cannot climb are a protection to the sleeper Travelers should carry their own camp cots and when putting them up should set the legs in tin cans filled with cresol or other disinfectant solution A light should be kept burning at night since ticks swarm when lights are out Bedding and baggage should be carefully searched before resuming a journey

As a preventive of the tick borne disease Chesterman recommends that prophylactic doses of acetarsone (stovarsal) tablets be taken on the first and third day after exposure to tick bites A dose of 0 25 grams (4 grains) may be taken 5 or 6 times on each of these days In treatment of the fever careful nursing with a nutritious liquid diet should be provided Vitamin C

can be added to fruit juice and vitamin B_1 to soup This diet should be continued after the crisis even though the patient is ravenously hungry and believes himself well In specific treatment penicillin is probably best and the next best is 2 to 4 intravenous injections of arsphenamines although these should not be given when crisis is imminent

For Central African tick borne relapsing fever when intravenous injections of arsphenamines are not available acetarsone (stovarsol) tablets may be given by mouth in doses of 0 25 gram (4 grains) 5 or 6 times daily Chesterman prefers this method of treating the Central African variety but stovarsol is far from being a harmless drug and may give arsenic poisoning to some patients

Epidemic Typhus (True Typhus, Louse Typhus Jail Fever Putrid Fever Petechial Fever European Typhus)

Definition An acute fever usually of abrupt onset lasting fourteen days

Cause Bacterialike bodies called Rickettsia transmitted by the louse

Distribution Europe has been the chief center of great typhus epidemics of the world Such epidemics are sometimes associated with war The disease has appeared in Asia Africa and North and South America It is most frequent in cold weather when heavy clothing and crowding of human beings favor the breeding and transmission of lice

Symptoms The patient becomes ill about six to fourteen days after infection often suffering from headache backache nausea and weakness At the end of the second day or sooner the temperature begins to rise and by the third or fourth day has reached 103° or 104° Sometimes chills or chilliness precede the fever The face becomes flushed Temperature falls rapidly at the end of the second week Those who die usually do so then While fever lasts there is great prostration the mouth is foul the intellect clouded Delirium may occur A *rash* appears on the third to the fifth day This resembles the rash of measles It seldom occurs on the face however but is most marked on the back

Complications which may develop include broncho-pneumonia and gangrene of the extremities

Mortality varies in different epidemics It may be as low as 5 per cent or as high as 70 per cent

Prevention Anti typhus vaccine should be administered in anticipation of exposure and repeated every four to six months House to house inspection for cases and quarantine of patients in treatment centers should be practiced DDT sprinkled in the seams of garments is a useful preventive of louse infestation

Delousing Measures These include shaving the body clipping the hair washing the skin and hair and immediately applying to all hairy parts DDT either as a powder (10 per cent) in talc or as an emulsion in the form of NBIN The application should be repeated after a week Clothes should be disinfected This can be done by steam sterilization or by boiling for five minutes When this is impracticable clothing may be soaked in 5 per cent cresol or 2 per cent lysol solution or treated with 10 per cent DDT in talcum powder

Storage of clothing for thirty days in cold weather or for three weeks in warm weather results in death of lice by starvation

Those attending patients or carrying out delousing measures should in addition to applying DDT powder to their persons and clothing wear overalls with wrists and ankles fitted under gloves and boots The face and especially the eyes should be protected by masks and goggles from droplet infection This special garb is very necessary for inspectors as epidemics may result from contact and inhalation of lice feces

Treatment Para aminobenzoic acid one of the B-complex vitamins is coming to be considered as specific for this and other diseases of the typhus group called rickettsial diseases The drug is given by mouth in powder form with an accompanying dose of bicarbonate of soda An initial dose of 8 grams (2 drams) is followed by 3 grams (45 grains) every 2 hours

More recently Aureomycin and Chloromycetin have been found effective for typhus fever and other diseases of this group

Besides specific treatment with para aminobenzoic and good nursing and other measures useful for fevers in general should be provided

Other Diseases of the Typhus Group (Rickettsial Diseases)

1 Endemic typhus or Murine typhus (Brill s disease) carried by rat fleas
2 Trench fever carried by lice
3 Japanese river fever carried by mites
4 Rocky Mountain spotted fever carried by ticks
5 South African tick typhus carried by ticks
6 Q fever carried by ticks
7 Other types of fever transmitted by ticks or mites

Treatment The same as for epidemic typhus

Undulant Fever (Malta Fever, Mediterranean Fever, Goat Fever, Brucellosis)

Definition A group of fevers usually of long duration associated with weakness sweating and rheumatic pains

Cause Three varieties of Brucella organisms are responsible for the disease in various locations In Malta where the disease is so common as to be given the name Malta fever the germ is conveyed through unpasteurized milk or milk products from infected goats In the United States some cases result from using unpasteurized milk of cows which are infected with a contagious disease causing abortion in cattle Another type in the United States is contracted by handling the carcasses of infected swine

Distribution Although the disease is best known in Malta and countries of the Mediterranean basin it can occur anywhere It is wide spread in the United States and known to occur in the Sudan South Africa Somaliland Northwest India China the Philippines and Mexico In Malta the fever begins most often in the summer soon after the kidding season when milk is heavily infected

Symptoms These may begin as early as six days and as late as several months after infection The patient suffers from headache sleeplessness and lack of appetite Fever may or may

not be ushered in by chill Fever may be very severe and continuous until death occurs or at the other extreme it may be intermittent and so mild that the patient although feeling miserable does not go to bed The term undulant fever refers to the type of the disease in which fever occurs in waves After a week or two of acute illness the temperature falls to normal only to rise again at the end of a few days in the first of a long series of relapses Prominent symptoms are profuse sweating constipation anemia emaciation and fleeting pains in the joints Relapses may continue for three to nine months or more than a year Eventually the temperature remains normal but the patient has by this time become a chronic sufferer from weakness and fatigue so that he may be unable to resume his work for some time

Mortality This is in general about 2 to 6 per cent A continued temperature of 104 (40° C) is an unfavorable sign

Diagnosis The disease is often mistaken for typhoid fever Laboratory tests of the blood make diagnosis possible A skin test is also available

Prevention Most cases of undulant fever could have been prevented by the simple expedient of pasteurizing or boiling milk and milk products The cases which are due to handling infected carcasses can be prevented by the wearing of long rubber gloves by those working in packing houses Protective inoculation against the disease is possible and should be routine among slaughter house employees and for laboratory workers whose work includes measures for the diagnosis of undulant fever

Treatment For *acute cases* Chloromycetin is probably the drug of choice Aureomycin and streptomycin with sulfadiazine have also given good results For *chronic cases* no treatment has been found specific Good nutrition good hygiene and the relief of pain by aspirin exert a beneficial effect

Sleeping Sickness (African Human Trypanosomiasis)

This should not be confused with Encephalitis which is in the United States sometimes called sleeping sickness

Definition An infection occurring in Africa and characterized by fever often prolonged and intermittent weakness and protracted lethargy which may be followed by insanity and death

Distribution This disease is found only in tropical Africa.

Cause Microscopic organisms called trypanosomes (Trypanosoma gambiense and Trypanosoma rhodesiense) are transmitted by different varieties of tsetse flies Animals especially large game but also domestic animals are thought to become reservoirs of the disease

Tsetse flies are somber colored insects larger than stable flies Most species bite only in the daytime and are attracted by dark colored clothes The bite is usually painless Those who wear no clothing are most exposed to infection

These flies are found in circumscribed districts or belts usually in shady regions at the side of a stream on the edge of a forest or sometimes on wooded plains The larvae develop to maturity in the female fly

Period Between Infection and the Beginning of Symptoms This period is three weeks

Symptoms 1 *First stage* The area of the bite becomes inflamed and painful Irregular fever which is not influenced by quinine may last for weeks *Swelling of the face* and of the eyes is sometimes present A little later lymph glands become swollen especially in the neck and armpits Itching of the skin and rashes are noticed especially in the case of white patients

2 *Second stage* Gradually most of the first stage symptoms increase The lymph glands however are now smaller and harder The body becomes swollen and flabby It is said that not until this second stage do the native Africans suffering from the disease complain Those who are noticed to be wearing a string around the head or to be using native medicines for headache are usually already in the second stage In this stage the muscles twitch and the tongue trembles when extruded The sufferer is sluggish mentally His character deteriorates and he cannot be trusted The body becomes dirty

and covered with sores Eventually the patient becomes drowsy and sometimes maniacal

3 *Terminal stage* The sufferer is now emaciated and appears too lazy to speak move or eat He may die in convulsions or in deep unconsciousness

Mortality Untreated the disease is almost invariably fatal Death occurs after three months to three years of illness In some districts sleeping sickness has reduced the native population by as much as two-thirds There is hope for recovery with proper treatment so long as the patient is able to sit up

Diagnosis This can be made by finding the typanosomes in the blood the spinal fluid or in material withdrawn through a hypodermic needle from the lymph glands Lay workers recognize the disease by the presence of persistent headache swollen glands in the neck and tremor of the tongue

Prevention 1 *Personal measures* When it is necessary to travel in daylight through regions known to be infected light colored clothes should be worn together with veils gloves and leggings A preliminary injection of Bayer 205 or Pentamidine should also be taken as a preventive of the disease The repellent 6-2-2-mixture mentioned under relapsing fever should be used

2 *Public health measures*

(*a*) Periodic examination for swollen glands of all inhabitants of infected areas at intervals of six months

(*b*) Treatment of all those found to be infected

(*c*) In rapidly spreading epidemics preventive injections of Bayer 205 given to all inhabitants This protects for three months or more Mass prophylaxis is also practiced by giving injections of Pentamidine every six months

(*d*) Restriction of travel to or from infected areas

(*e*) Clearing away underbrush and trees on watercourses frequented by native Africans (Carriers on motor roads are likely to become infected)

(*f*) Evacuation of infected village sites or even whole districts.

(g) Catching tsetse flies with sticky preparations or with fly traps

Treatment The earlier treatment is begun the better is the prospect for cure Two drugs are given by *intravenous injection* These are Bayer 205 (synonyms Germanin Forneau 309 *Morinyl and Antrypol) and Tryparsamide In the first stage* five injections of Bayer 205 at weekly or shorter intervals may produce a cure *In cases which have reached the second stage* Tryparsamide is the best drug It should be preceded however by three injections of Bayer 205 A period of two or three weeks should elapse after this preliminary treatment Then Tryparsamide is injected for 6 to 8 doses at 5-day intervals Accidents sometimes occur after the use of both of these drugs and injection should be given by a doctor experienced in their use

Accessory Treatment Patients are often suffering from several other diseases when infected with trypanosomiasis For this reason they should be examined especially for hook worm and schistosomiasis and treated for these diseases if indicated at an early date A liberal diet is needed and treatment of anemia with iron is often useful

South American Trypanosomiasis (Chaga's Disease)

This disease which is rarely encountered is due to Trypanosoma cruzi It is transmitted by reduviid (winged) bugs sometimes called assassin or kissing bugs Besides the human being cats dogs and other animals are susceptible to the disease

Symptoms are severe in infants under two years of age In adults the disease may be mild About ten days after the infecting bite a high continuous fever begins Inflammation of one eye and swelling of one side of the face are distinctive signs The liver spleen and heart may be affected and the glands enlarged In the chronic stage serious involvement of the nervous system and the heart occur and dropsy may become general

Treatment This is principally symptomatic. Recently

Bayer 7602 given by intramuscular injections has been re ported to be beneficial

Plague (Pest Black Death)

Definition An acute infectious disease characterized by sud den onset fever severe prostration and usually either painful swellings of the glands called buboes or more rarely in the pneumonic type of pneumonia

Cause An organism called the Bacillus pestis carried by the rat flea Plague is primarily a disease of rodents especially rats but also other rodents including the marmot in Siberia shrews and garbilles in Africa and ground squirrels in California and other Western States The rats most dangerous to man locally are the black domestic variety called Rattus rattus but the gray Norwegian rat (which occurs in this country) is more responsible for spreading the disease widely Epidemics occur in the season most favorable to the multiplication of fleas Ex treme heat and dryness are unfavorable to its spread Circum stances predisposing to the development of plague are filth poor sanitation which provides rats access to food and har borage poverty the existence of former epidemics in the same place a moderate temperature and a moist atmosphere

Distribution Almost world wide In India plague has caused over a million deaths in a year It is found also in South China the Netherlands Indies Africa especially in the north central and southern parts and along the seaboard parts of South America and a yearly case or two in California in the United States In London the Great Plague occurred in 1665 The disease may be introduced at any port by sick rats or patients or by infected fleas in bedding or baggage

Mode of Infection (*a*) In *bubonic plague* infection usually takes place through the bite of fleas which have fed on plague stricken rats or patients Occasionally the disease is acquired through infective material which enters the body through cuts or scratches

(*b*) In *pneumonic plague* infection occurs through breath ing in droplets of sputum from a patient suffering from this disease

Varieties of Plague

1 Bubonic type
2 Pneumonic type
3 Septicaemic type
4 Ambulatory type or Pestis Minor

1 *Bubonic plague* This is the most common variety named for the buboes or swollen infected glands by which it is characterized Symptoms usually begin *three to five days* after infection The onset may be gradual or sudden with a chill headache fever and prostration Vomiting may occur The mind is dull the speech faltering the features drawn and the expression either apathetic or anxious If the patient can walk *he staggers like a drunken man The temperature may be* 103 or 104° reaching 106° or 107 before death The pulse is very rapid the skin dry the face bloated and the eyes sunken or bloodshot The bowels are usually constipated

Buboes generally appear within twenty four hours but may occur at any time *from the first few hours to the fifth day* Of these 75 per cent are situated in the groin Occasionally and especially in children buboes are seen in the arm pit or neck As to size buboes may be smaller than walnuts or as large as goose eggs They are painful and tender The skin over the swellings is red Pus forms in the buboes and when *rupture oc*curs extensive sores result Hemorrhages may occur under the skin These are called death tokens Gangrene may develop *on the buttocks abdomen limbs face and other parts*

In severe cases the patient becomes very dull mentally Delirium stupor and profound unconsciousness may *ensue* Death in fatal cases usually occurs between the third and fifth days from heart failure In non fatal cases after buboes *appear profuse perspiration occurs* and symptoms subside Buboes enlarge and if not incised finally burst Sometimes they persist a month before bursting The pus may *have a foul odor* Occasionally buboes are absent As a rule convalescence begins between the sixth and tenth days but it may be delayed until *after two or three weeks*

2 *Pneumonic plague* This type in most epidemics comprises 3 to 4 per cent of all the cases In a few epidemics most

of the cases are of the pneumonic type A low environ mental temperature and moist atmosphere are favorable to its spread

Symptoms resemble those of pneumonia but are accompanied by greater prostration The sputum is thin and blood stained rather than rusty and sticky as in pneumonia No buboes are present

3 *Septicaemic plague* This is a form of blood poisoning It is due to an early and overwhelming invasion of the blood by the plague bacillus and may lead to death without the appearance of either buboes or pneumonia

4 *Ambulatory plague* In this type the patient is only slightly ill and continues to walk about He may or may not have buboes

Mortality Plague has been considered the most fatal of all epidemic diseases In bubonic plague the mortality has averaged in the past 75 per cent Now when treatment of bubonic plague with sulfa drugs is begun on the first day of illness and continued for a week or ten days without interruption most patients will recover But vaccinated persons who are exposed and acquire the disease may not survive unless they are adequately treated in this way

Formerly all cases of pneumonic plague were fatal With the use of new drugs a few recoveries have now been reported Sulfadiazine sulfamerazine and streptomycin have been used with success

Means of Prevention 1 Houses and ships should be rat proof The lower parts of a house should be built of hard brick or concrete and all vents covered with wire netting A curtain wall four inches thick is sunk eighteen inches into the earth all the way around This should have a right angle flange one inch thick extending out for eight inches

2 Rats are prevented from entering or leaving ships by keeping ships always at least four feet from the wharf by placing guards and funnels on ropes leading to wharfs and by taking gangways up when not in use

3 Rats should be destroyed by means of fumigation traps or poison At times of epidemics a method must be chosen

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with DDT Inexpensive houses or even whole villages are sometimes burned

Treatment 1 *Drugs* Sulfonamides are to be used in huge doses Six grams is the initial dose of sulfadiazine Then 2 grams every 4 hours Large water intake (3000 to 4000 cc) must be maintained by vein if necessary An output of 1500 cc of urine daily is essential The above doses are to be continued until improvement then gradually reduced but some of the sulfa drug should be given for at least 1 week of normal temperature

2 *Intravenous injection* of anti plague serum begun as soon as possible and repeated every 8 to 10 hours until symptoms abate

3 *Good nursing* The patient should be kept in bed until the temperature has remained normal for three or four days The fever should be treated with luke warm sponges every hour or two and an ice cap used for headache Heart stimulants may be needed Morphine may be given to relieve distress and promote sleep A liquid diet is indicated while fever continues and much water should be drunk

4 *Treatment of buboes*

(*a*) Painting with tincture of iodine if pus has not formed

(*b*) The continued application of hot wet dressings while buboes are red and painful

(*c*) The incision of buboes which are ripe *Caution* Do not incise early

(*d*) Antiseptic dressings to ruptured or incised buboes

which will simultaneously kill fleas Dead rats should be burned

4 For destroying fleas DDT in 10 per cent dilution in talc dust or discarded flour is probably best They are also killed by fumigation or kerosene emulsion

5 Immunization with anti plague vaccine repeated in six months if exposure continues

6 Isolation of patients for three weeks after complete recovery and quarantine of travelers from infected ports for a period of at least five days If infection has occurred symptoms will usually show themselves in two to five days

7 Protection of those who care for plague patients is accomplished by means of

(a) Using a screened ward from which animals (e g cats) and fleas are excluded

(b) Dusting DDT powder on ward floors and especially into the corners

(c) Undressing patients on a white sheet so as to see any fleas and after applying DDT putting all the clothes into a bag for sterilization by steam (autoclaving)

(d) Applying DDT powder to the patients themselves

(e) Using anti plague vaccine and anti plague serum injected on the same day and followed in ten days by second dose of vaccine

(f) The wearing of boots and puttees to protect the legs and overalls closed with elastic at the neck ankles and wrists

(g) The wearing of gloves either of rubber or for rough work of chamois to protect from infection through cuts and scratches on the hands

(h) The daily disinfection of attendants and their clothes

8 Disposal by burning of excreta and garbage Bedding clothes and other articles contaminated by discharges from patients to be sterilized by autoclaving boiling or soaking for one hour in 5 per cent cresol or 10 per cent formalin solution

9 Cremation of the dead with as little delay as possible If this is impossible they should be buried in deep graves

10 Disinfection of the house in which the patient was ill

China China the Philippines North and Central Africa Central America and South America the West Indies and the southern part of the United States

Cause

The cause is infection with the entamoeba histolytica usually through food or drink contaminated with the faeces of patients or of carriers of the disease

The entamoeba histolytica like other amoebae can alter its shape by throwing out fingerlike projections In this manner it surrounds and ingests blood cells Boring its way through the lining of the intestine it can reach the liver and give rise to liver abscess The lining of the intestine is often riddled with ulcers resulting from its action

The amoeba in the form described can be found in blood and mucus contained in fresh stools at the beginning of an infection Later under certain circumstances amoebae become smaller lose their activity and their power of ingesting blood cells and change into cysts In formed stools cysts are to be expected rather than the motile forms It is these cysts in the stools of infected persons which often contaminate food and drink and give rise to new cases of the disease The discovery of cysts in the stools of apparently healthy persons establishes their role as carriers Neither patients suffering from the disease nor carriers should be allowed to handle food Only by the most scrupulous cleansing of the hands can they avoid contaminating the substances they handle

Sources of Infection

1 Contaminated water or ice used in drinks

2 Contaminated fingers conveying the cysts to food or directly to the mouth

3 Flies

4 The contamination of garden produce eaten raw with human excreta used as fertilizer

The period between infection and the beginning of symptoms is as a rule at least twenty to ninety days or even longer Occasionally in an epidemic it is as short as seven days

Chances of recovery are excellent with proper and adequate

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THE DYSENTERIES
AMOEBIC AND BACILLARY

NEXT TO MALARIA the greatest disease problems in the tropics and the subtropics in general are the dysenteric diseases By this is meant diseases which give rise to loose stools containing blood and mucus Although these symptoms are sometimes associated with other infections the terms the dysenteries is meant to refer only to amoebic and bacillary dysentery These two diseases probably constitute the greatest potential disease hazard associated with travel in tropical parts of the world Unfortunately no vaccines have as yet been prepared to immunize against infections of this kind All the greater for this reason is the need for education in their regard

AMOEBIC DYSENTERY (AMOEBIASIS)

Definition

Amoebic dysentery is an infection of the lining of the large intestine with the microscopic animal parasite the *entamoeba histolytica*

Distribution

The disease may occur anywhere Even in localities where it has previously been unknown an infected person may start an epidemic usually by infecting the water supply But amoebic dysentery is more common in the tropics and semitropics than elsewhere and is especially prevalent in India Indo-

China China the Philippines North and Central Africa Central America and South America the West Indies and the southern part of the United States

Cause

The cause is infection with the entamoeba histolytica usually through food or drink contaminated with the faeces of patients or of carriers of the disease

The entamoeba histolytica like other amoebae can alter its shape by throwing out fingerlike projections In this manner it surrounds and ingests blood cells Boring its way through the lining of the intestine it can reach the liver and give rise to liver abscess The lining of the intestine is often riddled with ulcers resulting from its action

The amoeba in the form described can be found in blood and mucus contained in fresh stools at the beginning of an infection Later under certain circumstances amoebae become smaller lose their activity and their power of ingesting blood cells and change into cysts In formed stools cysts are to be expected rather than the motile forms It is these cysts in the stools of infected persons which often contaminate food and drink and give rise to new cases of the disease The discovery of cysts in the stools of apparently healthy persons establishes their role as carriers Neither patients suffering from the disease nor carriers should be allowed to handle food Only by the most scrupulous cleansing of the hands can they avoid contaminating the substances they handle

Sources of Infection

1 Contaminated water or ice used in drinks

2 Contaminated fingers conveying the cysts to food or directly to the mouth

3 Flies

4 The contamination of garden produce eaten raw with human excreta used as fertilizer

The period between infection and the beginning of symptoms is as a rule at least twenty to ninety days or even longer Occasionally in an epidemic it is as short as seven days

Chances of recovery are excellent with proper and adequate

treatment of the infection in its early stages Correct treatment is also successful in many chronic cases Without proper treatment the disease may be the cause of poor health over a period of many years and may finally prove fatal The final and complete elimination of cysts from the stools of chronic carriers may be difficult to achieve and many cases which have actually been cured are afterwards reinfected

Symptoms

Mild Cases An infected person may be quite unaware that he is ill He may never have noticed blood or mucus in his stools At times his chief complaint may concern periods of constipation For months or even years he may suffer from symptoms of indigestion vague abdominal discomfort slight anemia fatigue and nervous irritability without knowing that these symptoms are due to infection In persons who have lived where this disease is common any complaint of poor health or lack of strength should be suspected of being due to amoebic dysentery especially if there has been an occasional attack of loose bowels

Severe Cases These sometimes begin suddenly with acute symptoms They cannot be diagnosed from bacillary dysentery except by laboratory tests There are frequent discharges containing blood and mucus together with straining abdominal tenderness colicky pains and very occasionally fever and marked prostration Pieces of the lining of the intestine may be passed with the stools Death may result from exhaustion hemorrhage perforation of the intestine or from complications especially liver abscess In most instances acute symptoms subside and the disease becomes chronic In chronic amoebic dysentery while the patient may be in fair health most of the time chilling of the abdomen errors of diet or indulgence in alcohol often bring on acute symptoms Eventually anemia and emaciation may result

Complications

The chief complication of amoebic dysentery is liver abscess Occasionally abscesses occur in the brain spleen or other

organs Liver abscess may develop in a person who is not conscious of having suffered from dysentery The collection of pus in the liver pressing against the diaphragm tends to make breathing painful There is usually a sense of fulness under the right lower ribs An irregular temperature rising in the evening to 103 to 105 and falling to a much lower level in the morning is suggestive of an abscess Occasionally the abscess perforates the diaphragm and the pus is coughed up as sputum

Laboratory Diagnosis

The discovery of the entamoeba hystolytica or of cysts of this amoeba in stools establishes the diagnosis Finding the organisms is sometimes difficult however and a negative report from examination does not necessarily rule out the possibility of infection If a patient suffers from symptoms suggestive of amoebic dysentery and has lived where that disease is common the doctor may think it wise in chronic cases to give treatment for amoebic dysentery even in the presence of negative laboratory findings But if a doctor and laboratory facilities are available the amoeba is to be found in the stools in acute cases and usually also in chronic infections It needs to be remembered that bacillary dysentery mild or severe acute or chronic is nine times as common as amoebic dysentery

Prevention

The boiling of drinking water and the avoidance of contact of ice with drinks has been discussed on page 3, Exclusion of flies from privies kitchens and dining rooms is another important means of prevention Where night soil is used as fertilizer no raw fruit or vegetables can safely be eaten without the special preparation described on page 38 Nursing technique to prevent discharges of dysentery patients from spreading infection has been outlined on page 91 Probably the most important single precaution is the habit of always washing the hands before meals and before preparing food and also before leaving the lavatory The safest food can be infected by the fingers of those who handle it All those who handle food for the household should have their stools examined once in six months

Those found to be dysentery carriers should be suspended from contact with food treated and returned to their former work only when pronounced cured

Treatment of Amoebic Dysentery

1 *Treatment of Acute Attacks* The patient should be put to bed and given a liquid *diet consisting of clear soup albumin* water barley water or rice water and weak tea When diarrhea abates a semisolid nourishing diet is indicated such as that recommended for typhoid fever (on page 155)

Treatment with emetine (derived from ipecac) It is taken *for granted that a doctor has seen the patient had a specimen* of the stools examined and diagnosed the case He will probably inject *emetine hydrochloride* (1 grain or 0 06 gram) once a day subcutaneously for from 4 to 7 days preferably only until acute symptoms subside This treatment requires the service *of a physician because of possible ill effects of emetine on the* heart Emetine is the only drug known to kill the amoebae out side as well as inside the intestinal tract Any dysentery that does not improve after two or three doses of emetine is cer tainly not due to the entamoeba histolytica

Other drugs besides emetine used in the treatment of amoe bic dysentery Carbarsone and drugs of the oxyquinoline sul fonic acid group including diodoquin vioform chiniofon anayodin and quinoxyl are preferably given in acute cases in addition to emetine injections One who is not a physician *and for that reason should not administer* emetine can in an emergency give one of these drugs as a substitute The only known contraindications are disease of the liver or kidney

Carbarsone This drug owes its effectiveness to the arsenic contained Not more than 0 5 gram should be given in a day *Doses of 0 25 gram should be taken twice a day* for 10 days

Vioform Of this 0 75 gram may be given in a day It is recommended in doses of 0 25 gram 3 times a day for a week

Chiniofon (or Yatren) Three grams of chiniofon may be given by physicians in 24 hours The unqualified worker should give only 0 5 gram three times a day after meals for 7 days If chiniofon produces diarrhea or abdominal discom

fort these effects can be offset by giving small doses of paregoric e g ½ to 1 teaspoonful for an adult or five drops to a child of one year (see page 261)

Doses of *anayodin* and *quinoxyl* are the same as those of chiniofon These drugs of the oxyquinoline sulfonic acid group kill amoebae in the intestinal contents but not those which have entered tissues such as the liver

2 *Treatment of Carriers of Amoebic Dysentery* By the term carriers is meant persons who are not acutely ill but have cysts in their stools which might give rise to the infection of other people The symptomless or relatively symptomless cyst passers may often be effectively treated by carbarsone alone Doctors may give 3 or 4 capsules each 0 25 gram (4 grains) by mouth 3 times a day for 7 to 10 days Unqualified workers had better restrict themselves to the doses already mentioned i e 0 25 gram twice a day for 10 days Rare toxic symptoms which may follow the use of this drug include abdominal distress nausea vomiting and a skin eruption Stools should whenever possible be re-examined 4 to 6 weeks after treatment and again at the end of 3 months

Chiniofon is often used for treatment of cyst passers It may be used in the doses already given (0 5 gram 3 times a day after meals for 7 days) It is recommended that a second course of treatment with carbarsone should follow after an intermission of a week

The wearing of a light woolen band in order to prevent chilling of the abdomen is useful in preventing attacks of diarrhea in those who have suffered from chronic amoebic dysentery This measure may be needed only when sleeping out of doors

Treatment of liver abscess and other amoebic abscesses The injection of emetine is as a rule successful Emetine may be given by a physician in doses of 0 06 gram daily by injection for 8 to 10 days to patients with amoebic liver abscess This treatment should not be repeated for at least 3 weeks In other cases the doctor may withdraw pus by means of a large needle attached to a syringe Surgical operation is seldom necessary



while in other cases stools may number ten to thirty or even sixty in a day The temperature often rises to 101 to 103 Rarely there may be muscular pains headache delirium and stupor Vomiting is common but not persistent

Mild cases yield to treatment promptly In others the disease may last several weeks Very severe infections may be fatal in a few days Although the disease seldom becomes chronic 3 per cent of cases are said to be carriers Carriers are usually infectious for not longer than nine months

Complications

Arthritis is the most common complication The usual complaint is rheumatism in the joints It often occurs during convalescence and may last for some time but usually disappears eventually leaving no permanent ill effects In very severe cases perforation of the bowel and peritonitis may occur Acute inflammation in the eye is another possible complication *Diagnosis* should whenever possible be made by *laboratory examination of the stools A fresh stool preferably* containing mucus and blood should be placed in a closed glass jar to give the doctor when he arrives Apart from laboratory examination the following chart adapted from Manson Bahr may be of use in diagnosis

COMPARISON BETWEEN AMOEBIC AND BACILLARY DYSENTERY

Amoebic Walking dysentery	*Bacillary Lying down dysentery*
1 Onset usually insidious	1 Onset usually acute
2 Incubation period[1] long (20–90 days or more)	2 Incubation period short (7 days or less)
3 Fever rare (unless complicated)	3 Fever common
4 Duration of the disease may be long months or years	4 Duration is usually only days or weeks
5 Stools are moderately frequent and consist of faeces	5 Stools are very frequent scanty and odorless. They

[1] The incubation period is the period between infection and the appearance of symptoms.

BACILLARY DYSENTERY (EPIDEMIC DYSENTERY)

Definition

Bacillary dysentery is an acute epidemic disease due to infection of the lining of the large intestine by various species of the organism Shigella dysenteriae

Distribution

This disease is about nine times as common as amoebic dysentery It is found throughout the world but is especially prevalent and severe in the tropics and semitropics Conditions of crowding are favorable to the spread of the disease in asylums prison camps and military barracks

Cause

The cause is usually contamination of food or drink with the faeces of patients or carriers Unsafe water or ice uncooked fruits or vegetables and flies may convey the infection Diapers of babies suffering from dysentery should not be exposed to flies In hospitals unsterilized bedpans and enema equipment may spread the disease from patient to patient

The period between infection and the beginning of symptoms is short usually one to seven days

Mortality in well nourished individuals is seldom higher than 5 per cent although some cases are quickly fatal Among the poorly nourished of the native population the mortality in some epidemics may be 40 to 50 per cent *Complication with malaria greatly increases danger from the disease*

Symptoms

The onset is usually abrupt with diarrhea and colicky pains Blood and mucus appear in the stools Eventually the stools consist of little besides blood and mucus The abdomen is tender on pressure Straining at stool may be very painful and eventually the lining of the rectum may be pushed out and continue to protrude Stools are small in amount and not very offensive

Some cases are so mild as not to be recognized as dysentery

while in other cases stools may number ten to thirty or even sixty in a day The temperature often rises to 101° to 103° Rarely there may be muscular pains headache delirium and stupor Vomiting is common but not persistent

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mingled with mucus and blood their color is greenish or brownish resembling anchovy sauce the odor is offensive	consist mostly of gelatinous blood and mucus resembling red currant jelly
6 Straining at stool is not accentuated	6 Straining is very severe
7 Stools ested with litmus paper have an acid reaction	7 The reaction is alkaline
8 Complication abscess usually in the liver	8 Complications arthritis or inflammation of the eye
9 The disease is endemic (i e always present in the locality	9 There is a tendency to epidemic spread

Prevention

This is the same as in the case of amoebic dysentery except that chlorinization will kill all the organisms responsible for bacillary dysentery

Treatment

Immediate and complete rest in bed is indicated The patient should be kept comfortably warm A light band about the abdomen may lessen abdominal discomfort Very ill patients should not get out of bed If movements become extremely frequent it may be well to dispense with the bed pan and use a pad made of old soft muslin Absorbent cotton may be placed within the muslin to catch the blood and mucus which in severe cases is expelled almost continuously The skin of parts irritated by the discharge should be kept clean and covered with a light coating of vaseline When giving this care the nurse should wear rubber gloves if possible or at least scrub and disinfect her hands very carefully after contact with discharges If the lining of the rectum has been extruded by straining and appears as a shiny red tumor in the region of the anus the protruding mass should be anointed with vaseline and pushed back inside the opening cupping the fingers in such a way as to return first the part which came out last Then

the anus should be covered with a piece of gauze spread with vaseline and the buttocks strapped together with adhesive tape outside the area of irritated skin Such strapping discourages further prolapse of the bowel without interfering with bowel movements

Food for the first twenty four hours should consist of clear fluids such as clear broth and for adults tea with plenty of sugar *No milk should be given since milk is said to be not well borne in bacillary dysentery* The second twenty four hours smooth cereal like cream of wheat or rice water or strained oat meal may be given *without milk* Barley gruel is also useful or a little rice boiled very soft may be served in broth When the stools have decreased in number a little meat juice may be expressed from freshly broiled steak and added to rice If this agrees with the patient he may now have a small amount of tender beef or lamb ground fine and pan broiled with a little water Fruit juice diluted with water and sipped after meals may be given cautiously watching that it does not increase the number of bowel movements Scraped apple is very useful if available Later as the patient improves he may have a tender broiled lamb chop strained spinach and toast It should be endeavored to give a well balanced diet including the needed vitamins Instead of milk soybean milk may be used Food should be given warm and in small quantities at frequent intervals When blood and mucus have disappeared from the stools soft boiled eggs oysters custards and chicken are useful Return to the normal diet should be gradual Fruits and vegetables are the last to be added and anything with seeds strings or skins should be avoided for several weeks

Medication Whenever possible this should be prescribed by a physician A Shiga bacillus antiserum is available for injection in large doses This may be effective if used very early in the course of severe infections with Shiga organisms Bacteriophage is another substance which sometimes gives good results But although these and other remedies may be indicated in certain cases the use of the sulfa drugs has now become the preferred method of treatment

Sulfonamides (sulfa drugs) in Treatment of Bacillary Dysentery Sulfadiazine is usually the drug of choice Others of the same group of remedies which have been used include sulfathiazole sulfapyridine sulfasuccidine (sometimes spelled sulfasuxidine) and sulfaguanidine

Sulfadiazine in treatment of bacillary dysentery An initial dose of 2 grams (4 tablets of 0 5 gram) should be followed by 1 gram every 6 hours for about 6 days Doses for infants and children are up to 6 months ¼ tablet 4 times a day from 6 months to 1 year ½ tablet 4 times a day and an additional quarter tablet for each additional 3 years of age up to 16 years

Sulfasuccidine If the patient does not respond to sulfadiazine treatment may be shifted to the use of sulfasuccidine in doses of 5 grams every 6 hours

When using these sulfa drugs it is important to give abundant fluids It is estimated that in order to protect the kidneys from ill effect an adult should take 3500 cc (about 14 eight ounce glasses or 7 pints) of fluid The output of urine should be 1500 cc (about 3 pints) The urine should be kept alkaline by administering half a teaspoonful of bicarbonate of soda three times a day

Sulfadiazine as a Preventive Measure In case of an epidemic of bacillary dysentery one tablet of sulfadiazine (0 5 gram) may be taken by healthy persons twice a day as a preventive of infection Even with this small dose attention should be paid to an increased intake of fluid

Saline Treatment The results of giving sodium sulphate to sufferers from bacillary dysentery are sometimes only slightly less miraculous than those following the sulfa drugs Anyone could administer this treatment If sodium sulphate is not available magnesium sulphate (i e Epsom salt) can be substituted although it is not so good The dose of sodium sulphate depends upon whether the crystalline or the more concentrated powdered form is used Using the powdered form ½ teaspoonful dissolved in a little hot water is taken before food from 4 to 8 times a day The dose is gradually decreased In the case of the coarser crystalline salt the dose is 1 teaspoonful

For children the saline treatment may be used dissolving

the dose proportionate to the age [2] in 3 teaspoonfuls of water and giving this in teaspoon doses at intervals of 1 or 2 hours during the day

Advice for Emergencies The assistance of a physician is always needed for the care of patients suffering from dysentery In places where medical care is not always available however the lay person should not be entirely helpless in dealing with emergencies of this kind It is recommended that travelers destined for the tropics and likely to be left at some time to their own resources provide themselves with effective medicines for the treatment of both amoebic and bacillary dysentery A supply of tablets of carbarsone or diodoquin for amoebic dysentery and of sulfadiazine tablets for bacillary dysentery is suggested But how shall the untrained person know in any given instance whether to use these drugs? And if he thinks one of these remedies is urgently needed how can he diagnose the case and know which one to use?

For the help of anyone who must take upon himself the responsibility for these important decisions the following suggestions are offered

Diarrhea (no blood in the stools)

The first thing which occurs to the mind of the average person in explanation of a sudden attack of loose bowels is that some indigestible food has been eaten In slight cases the only measure necessary is to cut out fruits and vegetables from the diet and continue to exclude them until the movements have been normal for several days In case diarrhea is severe and painful something poisonous may have been eaten This is evidently the right diagnosis when several people who have eaten the same food develop symptoms simultaneously The thing to do then is to take a dose of castor oil Before administering any laxative however take the precaution of pressing with the hand on all parts of the abdomen and especially on

[2] Young's rule for finding the proportionate dose for children of given age is as follows Divide the child's age by the age plus 12 Thus, for a child of four $\frac{4}{4+12} = \frac{1}{4}$ of the adult dose

the right side below the level of the umbilicus where the appendix is usually located Should any spot be found which is so tender that the patient flinches when pressure is made upon it neither castor oil nor any other laxative medicine should be used

In any event rest in bed and a diet of weak tea and clear soup are indicated The abdomen should be kept warmly covered Most cases of gyppie tummy a painful type of diarrhea which is very common in Egypt will respond to this treatment On the other hand they are usually made worse by taking milk When symptoms persist more than a day or two a doctor should always be called He may find that the case is really one of bacillary or amoebic dysentery

In many instances of diarrhea the action of castor oil together with rest in bed and a liquid diet will be all that is needed to put an end to an attack After the intestines have been cleared with castor oil colicky pains usually cease If they persist relief can usually be secured by taking small doses of paregoric

Should the diarrhea become somewhat chronic a useful remedy is *kaolin*, in doses of ¼ teaspoonful to 2 teaspoonfuls according to the severity of the case The kaolin is to be stirred into a cup of water and repeated every 4 hours until diarrhea ceases Another effective drug is bismuth subnitrate given in doses of ¼ to ½ teaspoonful with a little water every 4 hours Bismuth imparts a black color to the stools

Diarrhea Due to Chronic Amoebic Dysentery Individuals who have lived where amoebic dysentery is common and have been known to suffer from that disease must always suspect that attacks of diarrhea are due to relapses It is quite possible that they still harbor amoebae in their intestines Such persons should ask their physicians what drug to take with them on a journey in case attacks occur when no medical help is available It may be that they will be advised to take carbarsone If diarrhea persists after the usual treatment with castor oil rest and diet they should resort to the medicine for amoebic dysentery whether or not blood appears in the stools

Severe Attacks of Bloody Diarrhea When symptoms of

dysentery appear suddenly and the patient is acutely ill with frequent stools containing blood and mucus bacillary dysentery should always be suspected Although some cases of amoebic dysentery are of this description the chances are nine to one in favor of bacillary dysentery The presence of fever and of painful straining at the time of bowel movements makes the latter diagnosis even more probable Since the greater immediate danger to life is usually due to the bacillary type of dysentery it is urgent to treat for this disease without delay It is to be hoped that the traveler dependent on his own resources has packed a supply of sulfadiazine tablets in his kit If that has not been done perhaps he can administer saline treatment If his diagnosis has been wrong since amoebic dysentery is *usually* a chronic disease rather than a quick killing infection it can be hoped that a doctor may be found in time to give the patient emetine injections or failing this that carbarsone diodoquin or vioform can be given a trial

In malarial districts never forget malaria Once more mention should be made of malaria Some of the most serious cases in which symptoms of dysentery occur are either due to or complicated by infection with malaria For dangerously ill patients who fail to respond to other treatment it will do no harm to try antimalaria drugs Success may reward this treatment when every other measure has failed

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INTESTINAL DISEASES
OTHER THAN THE DYSENTERIES

CHOLERA (ASIATIC CHOLERA)

Definition

Cholera is an infectious epidemic disease characterized by profuse diarrheal discharges of the so-called rice water character together with vomiting painful cramps in the muscles suppression of urine and collapse

Distribution

The disease exists continuously in Asia especially in India Great epidemics have spread from India through Asia Minor Egypt Russia Central Europe and North and South America

Cause

The disease is caused by infection with the Comma bacillus (Vibrio cholerae)

Circumstances favoring spread of cholera are defective sanitation and crowding At the time of an epidemic however all Europeans as well as the native inhabitants are in great danger

Mode of Transmission

The disease is spread through food and drink contaminated by the stools of patients suffering from cholera Flies or contaminated objects also may convey the infection Unsafe water

raw milk and fruits and vegetables eaten raw are especially dangerous

The period between infection and the beginning of symptoms is usually three to six days but may be as short as a few hours (or occasionally as long as ten days) Five days is the usual quarantine period to insure that a patient is not in the incubation period For carriers either those who are recovering from an attack or those who have manifested no symptoms two weeks is adequate as the organism dies out rapidly

Symptoms

These will be considered in four stages

1 *The Premonitory Stage* In some cases premonitory symptoms such as diarrhea languor depression nausea and discomfort in the region of the stomach are noticed before cholera is recognized In other cases there is no premonitory stage but rather a person in excellent health is seized suddenly and without warning with violent symptoms and dies within a few hours

2 *The Evacuation Stage* Profuse watery stools are passed one after another usually without pain Discharges occur in enormous quantities and are brown at first but later colorless resembling the water in which rice has been cooked Vomiting is profuse and the material vomited soon consists of this same rice water Vomiting is not associated with nausea and causes little distress Other symptoms during this stage are great thirst restlessness and agonizing cramps in the muscles of the abdomen and limbs

3 *The Collapse or Algid Stage* The surface of the body has now become cold and covered with clammy sweat Even the breath is cold The temperature taken in the arm pit may be several degrees below normal although rectal temperature is sometimes higher than normal The eyes are sunken the nose looks pinched and the cheeks are hollow The pulse is difficult to feel The voice is lost. The patient appears indifferent to what goes on around him but his mind is clear The urine becomes suppressed

Possible terminations of this stage are

[2 1]

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Possible terminations of this stage are

(a) Death Usually between five to twenty hours after the beginning of symptoms

(b) Rapid recovery In such a case the temperature rises to or above normal urine is voided and the pulse becomes sufficiently strong to be felt at the wrist

4 *The Stage of Reaction* Fever occurs and may last only a few hours or be continued as in typhoid fever Complications such as suppression of urine or pneumonia may now be the cause of death

Occasional symptoms of cholera include a very high temperature which may register 107° in the arm pit or 109 in the rectum Pregnant women usually miscarry during or after an attack of cholera

After effects of cholera include anemia mental and physical debility insomnia fever ulceration of the cornea of the eye jaundice bedsores and gangrene of the feet.

Atypical Varieties of Cholera

1 The *ambulatory* form in which patients are mildly affected but may serve as carriers of the disease

2 *Cholerine* or choleraic diarrhea in which diarrhea is severe but other symptoms are mild

3 *Very severe cases* ending in death in less than three hours

4 *Dry cholera* in which poisoning from the cholera germs is so intense that death occurs before there has been any diarrhea

Mortality

Mortality ranges from 20 to 90 per cent with an average of 50 per cent Some epidemics are very deadly while others are mild The very old the very young and the debilitated have a poorer chance for recovery than other patients

Diagnosis

At the beginning of an epidemic diagnosis is confirmed by laboratory methods Later after the epidemic is known to be in progress diagnosis is easy Manson Bahr suggests that epidemic diarrhea with a mortality of over 50 per cent may be

taken to be cholera Also any epidemic diarrhea in which patients cease to void urine and lose their ability to speak aloud is likely to be cholera

Preventive Measures

1 *Quarantine* This is difficult to execute The ideal precaution is to examine the stools of all persons entering ports from cholera districts and to isolate both patients and carriers

2 *Other Public Health Measures*

(*a*) Protection of water used for drinking or bathing

(1) By adding chloride of lime using for an average size well 2 glasses of lime dissolved in a pail of water and strained through muslin

(2) Or by adding potassium permanganate crystals to the well water in the proportion of 60 grains (4 grams) of potassium permanganate to the gallon of estimated capacity The water should be left until it becomes colorless before being used Vegetation and anything else which the water contains should be removed before the drug is added

(3) Buckets should be disinfected with chlorine before being used to draw water from wells

(*b*) Isolation of the sick in screened rooms and thorough disinfection of their stools and all contaminated bedding and clothing by soaking for at least one hour in 10 per cent formalin or 5 per cent cresol solutions added in amount equal to the stool or urine

(*c*) Discovery of carriers among the local population by laboratory examination of stools of persons in contact with the sick and segregation of these people until tests prove their stools to be harmless If laboratory facilities are not available such people should be segregated for two weeks

(*d*) Rigid supervision of over crowded districts to prevent cases being hidden

(*e*) Campaigns for dissemination of information about the nature and prevention of cholera This is done by means of literature posters parades of illustrative floats and exhibits of various kinds

(*f*) Vigorous anti fly campaigns

(g) Immunization with cholera vaccine Those entering cholera districts as well as those already living in such places should be thus protected Revaccination should be practiced every three months while the danger lasts and annually prior to the cholera season

3 *Personal Prophylaxis*

(a) Avoid uncooked food or drink *Hot foods and hot drinks are safest* because food materials may be infected *after* cooking Protect all foods from flies Such foods as raw lettuce and celery are especially dangerous Fruits with heavy peels like oranges and bananas can be made safe by covering them with boiling water for three to five minutes and then removing the skins Contaminated fish placed on the ice may infect butter and other foods in the icebox Ice itself may be made of unsafe water

(b) Restrict the diet to bland and easily digested foods Digestive upsets predispose to cholera Avoid taking medicine especially purgatives such as Epsom salts unless prescribed by a doctor

(c) Use no unboiled water for drinking brushing the teeth or for finger bowls When water cannot be trusted hot tea is a useful substitute In emergencies chemical disinfection of water (see page 36) is a second choice

(d) Always wash the hands before eating and before preparing food

(e) *Avoid visiting cholera districts* if possible Newcomers are especially susceptible

(f) Avoid over fatigue undue excitement and exposure to cold and wet Seek treatment promptly for all digestive disorders If diarrhea occurs seek medical advice at once It is said that those receiving sulfadiazine and intravenous injection of blood plasma at the onset of the disease are sure to recover

Treatment

1 Put the patient to bed raising the foot of the bed on bricks or blocks Keep him warm and dry by wiping the skin with hot dry cloths Arrange a bed pan comfortably for con

tinuous use and keep it warm with hot water bottle Cramps in the legs are best relieved by the intravenous injection of fluids

2 Give no food while the diarrhea is active Sips of ice water or soda water may be given for thirst Larger amounts are likely to be vomited After diarrhea subsides begin nourishment very cautiously using barley water or rice water *Do not give milk broths or jellies* After three or four days smooth cereal such as cream of wheat or strained oatmeal may be used Until urine is passed freely no further addition to the diet should be made

3 Never administer cathartics

4 *It is very urgent to secure a doctor who can administer intravenous injections* He will probably inject normal saline solution alkaline solutions and perhaps glucose solution to which vitamins are added After dehydration is relieved plasma or whole blood may also be injected *Intravenous injections are the most important measure for saving life*

5 The doctor will probably administer some sulfa drug In emergencies when no doctor can be secured sulfadiazine should be started as early as possible according to directions on page 100 if the patient can retain it

6 To combat suppression of urine when no doctor can be secured to give injections cloths wrung out of hot water may be applied over the part of the back between the lowest ribs and the hip bones

7 Nursing precautions All discharges and soiled linen must be immediately disinfected as just described under public health measures You can eat cholera you can drink cholera but you cannot catch it You are safe even in a cholera ward if you don t eat drink or smoke while there and clean up properly after leaving

SPRUE

SPRUE (also known as tropical diarrhea Ceylon sore mouth psilosis) is a chronic diarrheal disease characterized by a very severe form of inflammation of the lining of the digestive tract

Distribution

Sprue is common in Europeans who live or have lived in South China India Ceylon the Philippines Mauritius and Northern Australia It is found also in Central Asia the West Indies Central and South America and the Southern part of the United States It is rarely seen in North Africa Palestine and Syria and is apparently absent from Central Africa Although nationals of countries where the disease occurs are less likely to contract sprue than are Europeans they are not exempt

Cause

The initial cause of sprue is still unknown One important factor in the production of the disease is deficiency of vitamins of the B complex due either to lack of these vitamins in the diet or to inability of the individual to absorb them

Prevention

Although knowledge of the cause of sprue is incomplete certain measures are of value in resisting the disease A well balanced diet containing milk meat eggs whole cereals fruits vegetables constitutes an important safeguard An excess of starchy foods is to be avoided Good personal hygiene including exercise in the open air and plenty of rest and sleep are useful in keeping the digestive process normal Digestive disorders and dysentery in particular predispose to the disease Such conditions should receive prompt medical attention

Symptoms

1 *Sore Mouth* This is often the first symptom noticed The tongue and the lining of the mouth become sensitive Ulcers often appear on the edge or tip of the tongue Later the tongue becomes red bare and glazed or fissured Soreness may be so great as to prevent eating

2 *Diarrhea and Abdominal Discomfort* Diarrhea is characteristic It occurs in the early morning and consists of large

pale frothy stools which have an offensive odor There may be burning pain in the stomach and the abdomen may be greatly distended with gas

3 *Anemia* Under the microscope the blood shows a characteristic anemia similar to that of pernicious anemia

4 *Weakness depression and a muddy discoloration of the skin* may ensue In extreme cases the patient may lose half his normal weight

The outlook in mild cases is good *on condition* that proper and adequate treatment is given Even in severe and long standing cases the response to treatment may be gratifying especially if the patient leaves the tropics Relapses may be precipitated by either extremely hot or extremely cold climates

Without adequate treatment severe cases are usually fatal within a period of one to fifteen years

Treatment

1 *Liver Extract* The injection of *crude* liver extract is most important Injections are given daily or on alternate days for 5 to 15 doses After this the liver extract is injected at weekly intervals during convalescence Patients returning to the tropics may require injections twice a month for the rest of their lives The continuance of treatment is of course a matter for the judgment of the individual physician Liver extract taken by mouth is inadequate to cure the disease although it may improve the symptoms

2 *Folic Acid* has recently been used with success for treating the anemia of sprue Twenty milligrams are given daily

3 *Nicotinic Acid* Manson Bahr advises giving this vitamin in pure form in the amount of 0 150 gram (3 grains) daily for six months in addition to liver injections

4 *Diet* A bland nonirritating diet rich in protein and vitamins and containing little of carbohydrate and fat is indicated for patients suffering from sprue At the beginning of treatment of severe cases a diet of ground raw meat and milk is prescribed by some physicians Bananas and strawberries are also beneficial foods The doctor may in certain cases supple

ment the diet with iron calcium and vitamin D in medica form

5 *Auxiliary Treatment* In severe long standing cases there is need for

(*a*) Rest This is best obtained in a hospital

(*b*) Warmth Chilling must be avoided Patients should not be removed from the tropics while the diarrhea is active and should not move to a cold climate until treatment has built up their resistance

(*c*) Complications such as malaria or amoebic dysentery should be recognized and treated

(*d*) Mental and physical fatigue and pregnancy are conditions which should be avoided since they may bring on relapses

HILL DIARRHEA

Definition

A form of diarrhea closely resembling that of sprue which occurs principally in Europeans who go to a cool climate in the hills after residing in the hot lowlands of tropical countries

Symptoms

After reaching the hills a person who has previously been in good health begins to have diarrhea in the early morning hours probably between 3 and 5 A M Usually one to six stools are passed before 11 A M The discharges have an offensive odor and are copious liquid pale and frothy Occasionally typical sprue may develop

Treatment

In some cases rest in bed and a liquid diet bring about a cessation of symptoms Cases which persist in spite of these measures should be treated as sprue

INTESTINAL WORMS

INFESTATION with intestinal parasites is common in the tropics The following worms are chosen for description because of their comparative importance

Round Worm Infestation (Ascariasis)

The round worm (Ascaris lumbricoides) is a pinkish gray translucent worm about the diameter of a goose quill 6 to 9 inches in length and pointed at both ends Its incidence is world wide

Mode of Infection Human beings become infected by swallowing the eggs of worms In places where there is no proper disposal of sewage the eggs discharged in faeces are eventually blown about in the air and may be swallowed with food and drink In other cases flies may ingest the eggs and later deposit them on food Sometimes eggs of intestinal worms are taken into the body on vegetables which have been manured with human excreta

Prevention The proper disposal of night soil is a most important measure in this respect The exclusion of flies from kitchens and dining rooms and the careful preparation of food and drink (as described on pages 38–39) are essential

The Life History of Round Worms The female worm in the intestine of a human being discharges eggs in enormous numbers These require a short period of maturation outside the body before becoming infective Upon being ingested by human being after maturation the eggs hatch out The embryos which emerge do not settle down at once in the intestine but migrate to the liver and lungs before they finally return to the intestine via the trachea and the esophagus Becoming mature the parasites make their abode in the intestine but may take occasional trips into the stomach and even emerge through the mouth or nose Rarely asphyxiation may result from obstruction of the larynx or the worm may enter the eustachian tube which leads from the throat to the ear It may also carry infection into the bile ducts with serious effects Hundreds of worms matted together may form an obstructing mass in the intestine

Symptoms Usually the patient is not conscious of any symptoms Frequently however there is pain in the region of the navel and discomfort in the stomach In children nervous symptoms are common such as fretfulness ill temper bad

dreams and bed wetting When large numbers of worms are present children become pale and pasty looking They often have large abdomens and in extreme cases appear emaciated

Diagnosis This presents no difficulty when worms are seen in the stools Otherwise microscopic examination reveals eggs of the worms in the faeces

Treatment Although santonin and oil of chenopodium have long been favorite remedies for round worm infestation their administration is not free from danger of ill effects The safest remedy is hexylresorcinal This is also the most efficient drug and kills pin worms and hook worms which may infest the same patient The drug is not poisonous and can safely be used for the young the debilitated and when necessary for the pregnant

As in the case of other treatment for worms it is advisable for the patient to eat little food on the day before taking hexylresorcinal Rice and tender meat may be eaten but fibrous vegetables are to be avoided because they protect the parasite from the effect of the drug Epsom salts (1 or 2 table spoonfuls for an adult) should be administered at bedtime Early the following morning hexylresorcinal is to be given on an empty stomach *The dose* for adults is 1 gram (15 grains) For a child the dose may be estimated by allowing 0 1 gram (1½ grains) for each year of the child s age up to ten years After ten years the adult dose is indicated

Hexylresorcinal must never be given in liquid form or in uncoated pills Pills must never be chewed or burning of the mouth will result Specially coated crystoids are available on the market but in their absence sugar-coated pills may be used

After taking hexylresorcinal the patient may go about his work as usual He may drink water but should eat nothing for five hours The next morning he should take another dose of Epsom salts to help expel the worms

Pin Worm Infestation (Oxyuriasis)

The pin worm (thread worm or seat worm) is known as the Oxyuris vermicularis It is a thread like worm about one third

to one half inch in length Children everywhere are subject to infestation with these worms Adults in the same families often harbor the parasites

Mode of Infection Pin worms lay their eggs in the lowest part of the bowel or even on the skin outside the anus These eggs lodge under the finger nails during the act of scratching Eggs are conveyed by the fingers to food or directly to the mouth Sometimes flies ingest them and deposit them on food These eggs are infective at once without a period of matura tion

Symptoms Intense itching about the anus at night is due to the out wandering of female worms to lay their eggs An irritated condition of the skin around the anus may result from scratching Nervous disturbances such as restlessness during sleep grinding of teeth or picking of the nose are well known symptoms Rarely worms find their way inside the ap pendix and give rise to appendicitis

Diagnosis Worms may be seen in the stools or sometimes on the skin outside the anus The eggs are hard to find micro-scopically in the faeces The best way to secure them for ex amination is to apply a glass slide first to one side of the anus and then to the other side This should be done before the morning bath and with the patient bent over and straining slightly

Treatment This requires thoroughness and perseverance Upon discovery of a case of infestation every member of the patient s family should have an examination Those found to be infected should receive treatment Otherwise after being cured the patient may be reinfected by the untreated mem bers of the family Gentian violet is now considered the best drug for treatment of pin worm infestation *The dose for a child* is 1 tablet containing ½ grain (0 03 gram) of gentian violet after each meal for eight days It is preferable to use tablets which are especially coated to prevent their solution before reaching the intestine *The dose for an adult* is 1 grain (0 06 gram)

One method of administering gentian violet is to give the appropriate dose twice daily after meals for 8 days and after

ward rest from the medicine for 8 days before repeating the course Then after a second rest period of 8 days a third 8 day course of gentian violet is given

Something can be done for a patient suffering from pin worms even if no medicine can be given by mouth A daily enema of salt solution in the strength of a teaspoon of salt to a pint of warm water is useful for washing worms out of the rectum Anointing the skin around the anus with mecurial ointment will kill the worms when they wander out at night The wearing of pajamas instead of nightgowns prevents fingers from becoming infected The hands and the region around the anus should be washed with soap and water after each move ment of the bowels Soiled bed linen should be sterilized by boiling

Tape Worm Infestation (Taeniasis)

Tape worms are so named because they are flat like tape Some of them look like strings of oblong tickets fastened together Each *segment is complete in itself* possessing both male and female elements The head which is smaller than the other segments is furnished with suckers and sometimes hooks by which it clings to the wall of the intestine If after the use of worm medicine the head is still left in the intestine *the worm will form again*

Man is infected with the *beef tape worm* (Taenia sagi nata) especially common in Abyssinia by eating undercooked infected beef containing larvae of the worm Each larva is en closed in a tiny bladder or cystocercus About two months *after the meat containing larvae has been eaten adult worms* make their appearance in the human intestine Eggs of these worms are discharged in faeces and afterward infect the ox or cow when eaten with grass

Man becomes infected with the *pork tape worm* (Taenia solium) as the result of eating *undercooked measly pork* containing cystocerci The worm may occur wherever pork is eaten The pig in turn acquires the larval stage of the parasite by eating segments of the adult worm passed in the faeces of human beings

The *fish tape worm* (Dibothriocephalus latus) is the larg est of the tape worms sometimes twenty five to thirty feet in length It occurs in European countries Turkestan Japan Africa and other regions including parts of the United States It is acquired by man by eating infected raw fish Fish are in fected indirectly by eating crustacea (water fleas) which have consumed larvae developing from eggs deposited in water with human faeces

Symptoms of tape worm infestation are often lacking alto gether The patient may not suspect the presence of a worm until segments are discovered in the stools Occasionally there may be pain in the abdomen capricious appetite and anemia resembling pernicious anemia

Diagnosis By finding segments in faeces or on underwear or ova under the microscope in stool specimens

Prevention

1 Thorough cooking of beef pork and fish

2 Proper disposal of all night soil Faeces known to contain eggs or segment of tape worms should be burned

Treatment Whatever drug is used to rid a patient of tape worm a period of preliminary fasting is essential to success In particular no alcohol or fats are allowed for two days before treatment After this a dose of Epsom salts should be taken the evening before the medicine is to be administered The next morning no breakfast is to be permitted before taking the drug The treatment preferred by most physicians is a course of doses of aspidium or malefern

In case no doctor can be secured to treat the condition im mediately after the diagnosis has been made the lay person can try the old fashioned remedy of pumpkin seed Two or three ounces of the seeds are ground up and mixed with honey or syrup *All during the day before this mixture is to be given* the patient fasts from solid food On the evening of that day he takes a dose of Epsom salts The next morning only coffee or tea is permitted before the pumpkin seeds are adminis tered A few hours after swallowing the seeds the patient takes another dose of Epsom salts

In order to know whether treatment has been successful in expelling the whole worm including the head the patient should be instructed to pass all stools into a receptacle mix them with water and strain them through coarse gauze All segments thus isolated should be examined in the search for the head of the worm about the size of a pin head This should preferably be identified under the microscope but its presence may be strongly suspected if the segments become smaller and smaller until the last one passed is very tiny To prevent the worm from breaking before the head has been passed all effort to exert traction should be avoided A very warm enema may be given however to assist in the expulsion

When it is not possible to be sure whether the head of the worm has been expelled it will be necessary to watch the stools for the possible reappearance of segments about six weeks later

Cystocercosis Occasionally the larval stage of the tape worm affects man If for instance the eggs of the pork tape worm are swallowed by a human being his flesh may become affected similarly to that of the hog The cystocerci which are like tiny cysts may cause him no inconvenience if they are located in the muscle tissue If on the other hand they occur in the brain they may after lying dormant for years give rise to epilepsy

Hydatid Disease

The echinococcus granulosis is a tape worm of dogs Its larval stage however may occur in human beings Dogs become infected by eating the flesh of sheep harboring the larval form of the disease Persons intimately associated with sheep-dogs or dogs allowed to eat slaughter house offal may ingest the eggs of the worm from the faeces of the dogs As a result cysts filled with clear fluid develop in the liver or other organs of the human being This condition is known as hydatid disease

Although the adult tape worm in the dog is only about one eighth inch in length the cysts resulting from larval infection of human beings may become as large as a man s head They often appear as tumors distending the abdomen A skin test is

available to assist in the diagnosis of cystic tumors from this cause

Distribution Adult tape worms of this sort may affect not only the dog but the wolf jackal fox monkey and kangaroo They are found in Iceland Australia Arabia Algeria Tunis Egypt Abyssinia South Africa Argentina and Uruguay as well as in Southern Europe Wherever the worms exist in animals the cysts of hydatid disease may form in human beings intimately associated with the animals

Prevention Avoid contact with dogs in endemic regions and always wash the hands well before handling food

Treatment The only way to remove the cystic tumors of hydatid disease is by surgery

Trichinosis (Trichiniasis)

The parasite Trichinella spiralis is a small white worm just visible to the naked eye It is primarily a parasite of rats but pigs or wild boars become infected by eating diseased rats and human beings contract the disease by eating undercooked pork Pigs develop trichinosis also from eating garbage containing infected pork The cooking of garbage before it is fed to swine removes this hazard

When eating pork infected with trichinosis a person swallows hundreds of microscopic cysts From these cysts adult worms develop in the intestine The female worms give birth to myriads of larvae which travel by the lymphatics and veins and become encysted in the muscles Here they may remain alive for many years but generally they die and become calcified after a year or two In this disease the larval stage and the adult stage of the worm s development occur in the same host

Distribution Trichinosis may occur anywhere It is not uncommon in the United States and is also found in Europe and in China and India In Africa it is a menace to those who eat wild swine

Symptoms Many people who have never been conscious of symptoms are found at post mortem examination to have signs of previous slight infection especially in the muscles of their diaphragms Severe infection on the other hand gives rise to

violent symptoms These may follow the eating of diseased pork after a period varying from a few hours to several days Nausea vomiting abdominal pain and diarrhea are frequent symptoms Those who develop diarrhea are fortunate since many of the worms are thereby washed out of the intestine The taking of castor oil in treatment of diarrhea is a further aid in removing the worms Sometimes no diarrhea or pain is experienced but at a time from twenty four hours to seven days after the pork has been eaten fever sometimes accompanied by delirium and swelling of the face occur The eyelids may become so puffy that the eye appears to lie at the bottom of a pit in the center of a mass of swollen tissues After from ten days to three or four weeks the muscles of the body become tender and swollen The whole body may be so painful that even the pressure of the bedding is almost unbearable There may occur a transient rash similar to that of scarlet fever

The active phase of trichinosis lasts about three to four weeks After the larvae became encapsulated in the muscles acute symptoms subside Muscular pains however may persist

Mortality The average mortality is 5 per cent

Diagnosis The fact that a patient is known to have eaten undercooked pork aids in diagnosis but sometimes no such history can be elicited There is a skin test for the condition but this is not always reliable Microscopic examination of the patient s blood in trichinosis reveals a characteristic excess of the blood cells called eosinophiles This may be the means of diagnosis Occasionally adult worms or embryos can be found in the stools The presence of swelling of the face is very suggestive As a last resort a bit of the patient s muscle tissue may be cut out and examined under the microscope

Prevention The thorough cooking of pork should be routine One half hour of cooking should be allowed for every pound Smoked meat and cured meat are not excepted

Treatment In rare instances the patient is aware of having eaten undercooked pork and can take a dose of Epsom salts immediately Apart from this early measure treatment must be symptomatic and supportive Hot applications may give some relief to painful muscles The diet should be very nour

ishing including a good supply of protein and much fluid The physician may prescribe the vitamin B-complex calcium and iron in medicinal form

Hookworm Disease (Ancylostomiasis and Necatoriasis)

Definition Hookworm disease is an infection of the small intestine by either the Ancylostoma duodenale (Old World hookworm ") or the Necator americanus (New World hook worm) These worms look like a curved piece of thread about three eighths to one half inch long They inhabit the small in testine of human beings and suck the blood giving rise to anemia

Distribution The hookworm in one of its two forms exists wherever the temperature and humidity favor its development being constantly found between the latitudes of 36 north and 35 south of the equator The Old World hookworm is prevalent in southern Europe Northern Africa northern India and China and is also found in the Netherlands Indies Burma Malayan archipelago the Philippines South and Cen tral Pacific islands Portuguese West Africa Japan Australia and among the native Indians of Paraguay The New World hookworm is the one usually found in southern India Burma Malaya Netherlands Indies the Philippines Polynesia Micronesia Central and South Africa the Southern United States Central and South America and the West Indies

Places where latrines are inefficient or absent and where the population goes barefoot are most likely to be centers of the hookworm disease Persons such as farmers or miners who are constantly in contact with the soil are commonly affected The poor suffer more than the well to-do In some rural districts 10 to 90 per cent of the population are infected

Source of Infection Eggs of the hookworm are passed in large numbers in the faeces Within seven to ten days after stools are deposited on the ground larvae hatch out These cannot attain maturity except in the intestine of a human being The larvae usually pass through the skin of parts com ing in contact with the soil especially the feet From the skin they are carried to the lung and eventually make their way to the bowel They may however enter the mouth with food or

with dirt on the hands and pass to the bowel directly By the end of six to eight weeks after the larvae s entrance eggs of the adult worm begin to appear in the stools As many as a thousand worms may live in the intestine for as long as twelve years biting the lining of the bowel and consuming the blood Ill effects of infestation are due to loss of blood and to toxins absorbed

Symptoms First an eruption called ground itch appears on the skin at the point of entrance of the larvae Indigestion and abdominal pain may follow later but the essential symptom is increasing anemia Patients do not appear emaciated because of puffiness of the skin They may have a low fever and they become tired weak and apathetic The appetite may be poor but on the contrary it is often ravenous The attempt to satisfy the appetite may give rise to indigestion Infected children are poorly developed for their age and often have pot bellies

Diagnosis Discovery of the eggs of the worm in the stools is easier after hookworm medicine has been given than before In old infections there may be no eggs in the stools and anemia may be the only indication of the disease Blood examination may give a clue through the discovery of abnormal numbers of the blood cells called eosinophiles

Prospects of Recovery Untreated cases usually become chronic but in severe infections death may occur after a few months Results of treatment are good even in severe cases

Prevention

1 Building latrines to prevent defaecation on the ground
2 Using night soil as fertilizer only after it has been buried or stored in water tight pits for two or preferably three months
3 Providing shoes for those who work on infected ground
4 Using gloves when handling damp infected earth or vegetables grown therein
5 Either abandoning infected ground or treating it to kill the parasites The latter purpose can be achieved by burning thickly scattered straw on the surface of the ground

6 Protection of food and drink from infection and the practice of always washing the hands before eating

7 Periodic inspection of employees in places where infection is common and examination of the stools of those who appear anemic or have indigestion

8 Education of workers in order to gain their cooperation in prevention and treatment The cinema is sometimes used for this purpose[1]

Treatment A number of remedies are used with success These include thymol oil of chenopodium and carbon tetrachloride At present the best drugs for treatment are hexylresorcinal and tetrachloroethylene

Hexylresorcinal is used according to the instruction given under the treatment of round worms (on page 196) This is a safe drug and the best one for the treatment of children debilitated patients and the pregnant It has the advantage of killing other kinds of worms which may be present

Tetrachloroethylene may be the drug of choice for *mass treatment* because although a light evening meal and a purge may precede its administration *no preliminary treatment is absolutely necessary* For mass treatment the following procedure is recommended by Brown

Dissolve a dose of Epsom salts in half a glass of water The adult dose 2 cc of tetrachloroethylene is added to this and the whole shaken up and swallowed at one time Any of the drug adhering to the glass should be drunk with additional water

It is well to refrain from eating fats or drinking alcohol just before or after taking the drug The purge should take effect before food is eaten

Various workers report the removal of 77 to 97 per cent of hookworms by a single treatment of this sort Round worms however often co-exist with the hookworms and they may be stimulated by this treatment For this reason when round worms are present it is well to precede treatment with tetrachloroethylene by a dose of hexylresorcinal

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ease since most of the symptoms result from loss of blood due to the hookworm s activity When no drug for removing the worms is available large doses of iron together with a nutritious diet containing meat may restore the patient to relatively good health but will not keep him so In severe infections such supportive measures should precede and accompany the administration of the worm medicine

Strongyloidiasis

Another worm even smaller than the hookworm is the Strongyloides stercoralis It may be found anywhere but especially in Brazil Cochin China and Africa Its larvae like those of the hookworm pierce the skin to gain entrance to human beings

Symptoms occur in two phases In the first or intestinal phase diarrhea is the symptom noticed In the second phase the lung is affected and bloody sputum expectorated

Treatment Gentian violet in tablets with a resistant coating constitutes the usual treatment It is recommended that 2 tablets each containing ½ grain of gentian violet be given 1 hour before meals 3 times a day for 16 days In obstinate cases a solution of gentian violet is sometimes introduced through a tube into the small intestine

MISCELLANEOUS TROPICAL DISEASES

THE PRECEDING pages deal with parasites of the intestinal tract Other sorts of worms invade the lymph vessels the loose connective tissue in various parts of the body the veins and the substance of organs such as the lungs and liver Diseases produced in this way are now to be described

FILARIASIS

Definition

This term applies to a group of diseases due to invasion of the lymphatic system or connective tissues by filariae thread like worms which produce living embryos in the human body These diseases are all conveyed by biting insects

Filariasis of the Bancroft Type

This disease is due to the Filaria bancrofti a hairlike transparent worm three or four inches in length Worms of both sexes are found in lymph vessels and glands The female gives rise to an unending stream of living embryos or microfilariae which pass into the blood Microfilariae exist in the blood of many people who have never shown any symptoms

In some countries microfilariae can be found in blood near the surface of the body only at night By midnight three hundred to six hundred can be counted in every drop of blood examined By 8 or 9 A M all the organisms have disappeared If the individual is made to sleep in the daytime for three

days the process is reversed There is no satisfactory explanation for this nocturnal periodicity

In contrast to the periodic or classical form of filariasis bancrofti just described there is a non periodic type which appears to be restricted to the islands of the South Pacific area

Mode of Infection Various kinds of mosquitoes convey the periodic type of filariasis in different countries In India the West Indies and the Philippines the Culex fatigans mosquito is usually the responsible mosquito In the non periodic variety found in the Pacific islands the Aedes scutellaris a mosquito peculiar to that part of the world usually transmit filariasis

The mosquito when biting an infected person takes into its stomach with blood a large number of microfilariae These undergo changes in the mosquito and larval filariae are produced which enter the mosquito s proboscis After this when a mosquito bites the larvae wriggle out of the proboscis and enter the puncture in the victim s skin

Distribution The disease is widespread in the tropical and subtropical world but is especially common in India South China the West Indies and the Pacific Islands

Symptoms Filariae are not poisonous to the system and most cases of infection produce no symptoms When disease symptoms occur they usually result from obstruction of the flow of lymph or to a developed sensitization The following are some of the possible manifestations of the disease

Enlargement of lymph glands is a common symptom in the Pacific non periodic form of the disease

Cordlike swellings of the lymph vessels in the groin and red streaks and swelling in the legs and elsewhere result from an inflammatory process due to the filariae and are accompanied for several days by chills fever headache and vomiting These red streaks or inflammation always spread centrifugally

Filarial abscesses seated deeply between the muscles are said to be common in New Guinea Abscesses also occur about infected lymph glands as in the groin or arm pit Dead filarial worms may be present in the abscess cavity

Milky urine (chyluria) a rather rare condition due to rupture of distended lymph vessels into the bladder is associated with the *periodic* kind of filariasis

Painful inflammation in the hip or knee is an occasional symptom

Elephantiasis may result from repeated attacks of filariasis It practically never occurs except in native people exposed over a period of many years In this condition the blocking of lymph vessels by calcified filariae results in enormous enlargement of the parts normally drained by these vessels Periodic attacks of secondary inflammation contribute to the result In 95 per cent of cases elephantiasis affects the leg or the scrotum Less frequently the arm the breast or the external genitals of the female may be enlarged

Elephantoid fever may accompany inflammation of the lymph vessels elephantiasis or other manifestations of filariasis It occurs at intervals of weeks months or years This fever begins with a chill and ends with sweating and may easily be mistaken for malaria

Prevention As in the case of malaria anti mosquito measures are essential Local health officers should be consulted as to methods needed to exterminate mosquitoes since these differ in different localities Wherever the disease is prevalent both the infected and uninfected should sleep under nets and foreigner s quarters should be two hundred yards or more distant from native quarters Those capable of infecting mosquitoes are a danger to the community

Treatment Hetrazan is said to clear the blood stream of microfilariae Apart from this rest gives relief when lymph vessels are swollen and fever is present Sulfa drugs are useful in some instances In advanced cases enlarged parts of the body may be supported by bandages or removed by surgery

Foreigners infected with filariasis need not fear sterility impotence nor elephantiasis Worms do not multiply in their bodies Attacks of fever and swelling of the lymph glands and vessels will decrease and finally disappear within a year or two

Loa Loa Filariasis

Cause Infection with the loa loa filaria sometimes called the eye worm is conveyed by the bite of the mangrove fly (Chrysops) These flies bite from sunrise to 10 or 11 A M and from 4 P M till dark They prefer the shade to the bright sun light

Distribution This disease is found in West and Central Africa and particularly along the Congo River and its tribu taries

Symptoms Adult worms circulate about the connective tissue and appear beneath the skin where it is loose and soft They may be seen about the fingers on various parts of the trunk and also under the surface of the eye where they cause conjunctivitis with irritation and fear of light

Migrations of adult filariae cause pricking and creeping sensations As an allergic reaction to the worm Calabar swell ings occur at intervals generally on the back of the hand or forearm but also on other parts of the body These are painless swellings about the size of hens eggs They subside in a day or two

Prevention is practiced by the use of a mosquito net with a fine mesh

Treatment No drug is known which destroys the parasite When worms appear under the skin or in the eye they can be removed through a small incision Injections are sometimes given to desensitize against the worm and prevent Calabar swellings Cooling lotions may allay irritation

Onchocerciasis (Filariasis Due to the Onchocerca Volvulus)

Cause The buffalo gnat (simulium) becomes infected by biting persons with the microfilariae in their tissues and there after conveys the disease through its bite to other individ uals

Distribution This disease is widespread in West and Cen tral Africa and is found more rarely in Uganda It also occurs in certain areas of Southern Mexico and Guatemala

Symptoms Hard nodules develop in different parts of the

body These contain both adult worms and larvae The tumors vary in size from a pea to a pigeon s egg They are painful when small but painless when fully developed Their number may vary from 1 to 6 although as many as 150 have been found in one person In Africa the most frequent sites of tumors are the ribs hips knees elbows and back When near the hip joint tumors may cause limping and when they are situated in the head or neck larvae may enter the eye causing inflamma tion and impaired vision In Guatemala and Mexico nodules are usually on the head particularly in the scalp and eye com plications are common

In the skin the presence of large numbers of larvae results in either a mottled papery appearance especially on dark skin and in the region of the shin or a thickened condition re sembling elephant skin may appear usually on the thighs and abdomen Such abnormal skin sometimes becomes infected through scratching This filaria is one of the possible causes of the skin condition known as craw craw

Prevention A mosquito net with a fine mesh protects from buffalo gnats

Treatment Whenever possible all nodules should be re moved as soon as possible This can be done under local anes thesia By removal eye complications may be prevented When not removed they are a means of infecting buffalo gnats and thereby spreading the disease

GUINEA WORM INFECTION (*DRACONTIASIS*)

Distribution

Guinea worms are found in the Nile Valley West Africa Nigeria Uganda Iran Turkestan Arabia and India In parts of Deccan (India) nearly half of the population may be affected at certain seasons and on the West coast of Africa nearly every Negro has one or more such worms

Cause

The adult female guinea worm measuring two or three feet in length appears like a heavy winding thread under the skin of an infected person When the worm is ready to discharge the

embryos with which it is packed it secretes some fluid which raises a blister under the skin A burning sensation causes the part to be immersed in water whereupon the blister breaks and a small transparent tube the uterus of the worm protrudes fills with milky fluid and bursts on contact with cold water discharging embryos These swim about when shed in fresh water and enter the bodies of cyclops (water fleas) Infected cyclops are swallowed by man along with drinking water and afterwards in the stomach the larvae emerge from the dead cyclops and find their way into the connective tissues Development into an adult worm requires a year After attaining maturity female worms work their way to the parts most likely to come in contact with water usually the feet and legs In India water carriers sometimes suffer from guinea worm on the part of the back which comes into contact with the water skin

Prevention

Drinking water should be protected from pollution by persons suffering from guinea worm Adding potash to wells or raising the temperature of the water by a portable steam generator kills the cyclops Barbel fish which feed on cyclops are sometimes introduced into wells Boiling the water used for drinking purposes removes the risk of infection

Treatment

Douche the part affected in water at every opportunity After about fifteen or twenty days of this treatment the embryos should all have been discharged Now exert gentle traction and wind the part of the worm which emerges each day on a match stick Be very careful not to break the worm or great irritation and pain may result At the end of each treatment of this sort apply a dressing wet with a 1 1000 solution of bichloride of mercury over the stick on which the worm is wound Daily treatment in this manner will finally result in the complete removal of the worm

A physician may be able to facilitate removal of the worm by injections of phenothiazine into the tissues at some distance

from the worm or by injecting a solution of bichloride of mercury directly into the worm itself

SCHISTOSOMIASIS (BILHARZIASIS)

Definition

This term is used to denote a group of diseases due to invasion of the veins of certain organs by several varieties of schistosomes These parasites are trematodes or flat worms called flukes because of their fancied resemblance to fish

Urinary Schistosomiasis (Due to Schistosoma Haematobium)

Distribution In Egypt 50 per cent of the peasant population is said to be infected The disease occurs also in North Central South and West Africa Iraq Palestine Arabia Cyprus Portugal and some other places

Mode of Infection Eggs of the parasite are expelled in the urine of those who suffer from the disease The eggs hatch on coming into contact with fresh water and the emerging embryos enter the bodies of fresh water snails In the snail s body infective larvae (cercariae) develop These escape from the snail and burrow through the skin of persons who come into contact with the water as in wading and bathing Penetration of the skin gives rise to itching and redness Having pierced the skin larvae enter the blood where they undergo further changes Adult worms develop after about six weeks and live chiefly in the veins surrounding the bladder Their eggs are discharged into the lining of the bladder and are afterwards released with blood into the urine by the process of ulceration

Symptoms About four weeks after exposure fever and hives may occur There may also be a cough at this time Usually not until three to twelve months or more later do urinary symptoms appear These consist of varying degrees of local discomfort and pain accompanied by the passage of blood at the end of voiding

Untreated the sufferer often continues to pass bloody urine for years Spontaneous recovery is seldom complete Eggs of the fluke sometimes become the nucleus of a stone in the

bladder Infection may travel upward to the kidney or may affect the genitals and be mistaken for venereal disease

Diagnosis The disease is usually recognized by finding the distinctive eggs of the fluke on microscopic examination of bloody material passed in the urine In some cases it may be necessary to examine a specimen of mucus obtained from the lining of the bladder by cystoscopy

Prevention Popular education is essential No evacuation of discharges should be allowed near fresh water Children and adults should be warned neither to wade bathe nor fish in infected water nor to drink it Drinking water should be *boiled if possible Clear water may be heavily infected* Ordinary chlorinization cannot be depended upon to kill the organism Infected water is safe for bathing when it has stood for forty eight hours If doubtful water must be used for bathing it should be treated with copper sulphate (in a final dilution of 1 200 000) or with lysol cresol or other antiseptics Reduction of the number of snails in ponds streams and irrigation canals is attempted by means of clearing away vegetation periodic drying of canals and the addition of copper sulphate or other disinfectants to the water

Treatment of urinary schistosmasia usually consists of the injection of antimony compounds Among these potassium antimony tartrate (tartar emetic) or sodium antimony tartrate are injected into the vein or fuadin into muscle tissue

Intestinal Schistosomiasis (Due to Schistosoma Mansoni)

Distribution This variety of fluke infection occurs in Egypt the East Coast of Africa and Central and South Africa South America and the West Indies

Mode of Infection Infection with this fluke occurs as in urinary schistosomiasis

Symptoms Preliminary symptoms are more severe in this disease than in the urinary variety They consist of hives abdominal pain loss of appetite chills and coughing In one or two months or more symptoms of dysentery may develop and eggs of the fluke can be found in the blood and mucus passed in stools Thickening of the bowel can be felt like tumors in

the abdomen Ulceration sometimes occurs around the anus and buttocks Later enlargement of the spleen and liver may be marked

The outlook for the patient in mild cases is good on condition that adequate treatment is given Chronic cases with dropsy and enlargement of the spleen and liver are difficult to cure although they may live for years Prospects for recovery are especially poor when ulceration and tumor formation have occurred Some patients die of lung complications

The prevention and treatment of intestinal schistosomiasis are similar to those described in connection with the urinary variety

Schistosomiasis Japonica (Due to Schistosoma Japanicum)

Synonyms Katayama disease Oriental bilharziasis Eastern schistosomiasis

Distribution This disease is found in the Far East especially China Japan Formosa and the Philippines

Symptoms These are similar to those of intestinal schistosomiasis but more severe A greater proportion of patients ill with schistosomiasis japonica become emaciated and develop enlargement of the spleen and liver together with distension of the abdomen with fluid *This is the most serious form of schistosomiasis*

Prevention Snails which convey this disease live in inaccessible places and are difficult to exterminate Dogs and other animals are susceptible to infection and serve as reservoirs

Sportsmen when shooting snipe need to wear high boots lest they become infected while wading in rice fields

Treatment Similar to that of other diseases of this group This is the most difficult type of schistosomiasis to eradicate New drugs under experimental trial may prove better than any of the remedies available at present

OTHER FLUKE DISEASES

VARIOUS OTHER trematodes may cause disease in man Of these only two will be discussed The one Pargonimiasis is a fluke of the lung The other Clonorchiasis is a liver fluke

Paragonimiasis (Due to the Lung Fluke)

Distribution This disease occurs principally in China India Japan Korea and the Philippines

Cause Lung flukes (Paragonimus westermani) are reddish brown thick and fleshy oval organisms about 10 by 5 mm in size (roughly ⅖ by ⅕ inch) Eggs of the adult flukes in the human being escape in sputum and faeces and give rise to infection of fresh water snails In the snail forms of the organism develop which infect crabs and crayfish Man is infected by eating raw or improperly cooked crabs of which Koreans are very fond with the raw juice of the crayfish which is taken as medicine for diarrhea Infection through infected water is also possible The flukes after having entered the human body attain adulthood and produce burrows and tunnels usually in the substance of the lung These give rise to spitting of blood Other organs including the liver and brain may be affected

Symptoms There is usually a chronic cough in this disease accompanied by bloody sputum Diarrhea and abdominal pain may also occur

Diagnosis is facilitated by discovery of the characteristic eggs of the fluke in sputum or faeces

Prevention Sputum and faeces of infected persons should be destroyed in order to prevent pollution of fresh water People should be educated not to eat uncooked crabs or crayfish

Treatment No drug is known which destroys the parasite in the human being Improvement of symptoms is said to follow injections of emetine and prontosil

Clonorchiasis (Due to the Liver Fluke)

Distribution This is a disease of the Far East including India Mauritius Japan Korea Formosa and China In some parts of China 50 to 67 per cent of the native population are infected

Cause The fluke responsible for this disease inhabits the bile ducts of man and some animals Eggs of the worm passed with discharges into fresh water infect the snail From the

snail infection passes in turn to fresh water fish of the carp family Man becomes diseased by eating raw inadequately cooked or even dried salted or pickled flesh of infected fish

Symptoms Enlargement of the liver is sometimes accompanied by diarrhea and jaundice Later dropsy appears together with a very severe anemia which may prove fatal after several years

Prevention All fresh water fish should be thoroughly cooked before consumption

Treatment This is unsatisfactory Intravenous injections of tartar emetic fuadin or gentian violet are sometimes used

LEISHMANIASIS

ONE VARIETY of leishmaniasis kala azar has already been described on page 158 At this point two additional forms of leishmaniasis will be discussed These are Oriental sore and espundia

Oriental Sore (Cutaneous Leishmaniasis)

Synonyms Tropical sore Aleppo button Delhi boil Baghdad boil

Description This is a sore which begins like a pimple crusts over and breaks down into an ulcer which lasts six months to a year or even longer unless specific treatment is given The ulcer is followed by a depressed and often disfiguring scar The sores may be single or multiple One attack confers immunity

Distribution In Baghdad almost everyone has scars of sores and these are often on the face The disease occurs in other parts of Iraq and in Arabia Iran Sudan Palestine Trans jordania North Africa Egypt Syria Caucasus India Trans caspia Turkestan South China West Indies Central and South America Mexico Southern Italy Southern Greece Sicily Crete Cyprus and other places Usually kala azar and Oriental sore do not occur in the same locality but in Central Asia the two diseases exist together and neither affection surely confers immunity from the other

Cause Tropical sores are due to the Leishmania tropica probably transmitted in most cases by the bite of the sandfly

Direct inoculation from man to man however is possible The disease exists notably in dogs but also in cats brown bears and horses

Prevention General measures against sandflies are indicated as in prevention of kala azar Dogs with sores should not be allowed in the vicinity of residences Prophylactic inoculation produces sores after two or three months and these protect against further infection

Treatment Intravenous injections of antimony compounds such as tartar emetic or better than the latter neostibosan or neostam are efficacious in the case of multiple sores Berberine sulphate is sometimes injected around and under the ulcer but this treatment is painful The local application of X ray in a single full pastille dose usually produces a cure in ten days Carbon dioxide snow is effective if applied locally for 5 to 30 seconds depending on the size of the sore and repeated every ten days until healing is apparent

Espundia or American Leishmaniasis

Distribution This form of leishmaniasis is found principally in South America Central America and Mexico

Cause The causal organism the Leishmania braziliensis is probably conveyed by the bite of the sandfly

Symptoms The disease usually begins with a sore on the skin often on the margins of the ears After this ulceration occurs on the nose spreading to the lips mouth and throat Multiple sores may appear on the body

Treatment For generalized sores antimony preparations are injected but these are not always wholly effective for lesions in the mouth Atabrine hydrochloride is recommended for injection into the base of sores using 5 cc or 10 per cent solution At the same time 1 tablet (0 1 gram) of atabrine is given by mouth 3 times a day for 7 days

LEPROSY (HANSEN S DISEASE OR HANSENOSIS)

Distribution

At the present time leprosy occurs principally in the tropics and subtropics It is found especially in India Africa China

Malaya the Pacific Islands the West Indies and the northern part of South America but also in many other countries Many patients in the United States are isolated and treated at the leprosarium in Carville Louisiana Many infected persons also are at large Leprosy has largely died out in the northern states Only in the southern part of the United States does the disease increase indigenously to some extent

Cause

The disease is due to the Bacillus leprae which closely resembles the bacillus which causes tuberculosis Conditions favoring spread of the disease are humidity of atmosphere and close and continuous contact with infected persons especially those suffering from the nodular type of the disease in which discharges are present Leprosy is probably not hereditary although it tends to run in families Children removed from their mothers immediately after birth usually remain normal The mode of infection is unknown but is probably through the nose or the skin With ordinary precautions there is practically no danger to attendants who care for patients but long and close association in families spreads the disease

Early symptoms

As a rule no symptoms are noticed until after a period of two or three years following infection In extreme cases the incubation period may be as short as a few weeks however or as long as forty years Early symptoms are vague and indefinite There may be fatigue and mental depression or the first thing noticed may be changes in some part of the skin such as thickening change in color or loss of sensation In some cases contracture or atrophy of some muscles of the hand or foot with resulting deformity may be an early symptom In other cases quite suddenly nodules appear on the skin The formation of crusts in the nose may be followed by nasal obstruction There may be fever and neuritis or arthritis may be so severe that the patient cannot move his limbs

Sometimes before the development of nodules a rash appears This is usually symmetrical on both sides of the body

Patches may be pink brown fawn color or lighter than the rest of the skin They may disappear and return Loss of hair in the affected parts is striking especially in the region of the eyebrows and beard Gradually the deposition of leprosy bacilli causes thickening either on the skin or in the nerves Deposits on the skin give rise to the *nodular* type of leprosy Deposits on the nerves on the other hand characterize the *nerve type* of the disease Most cases are not exclusively of either type but mixed with either one or the other type of abnormality predominating

Nodular Leprosy (Lepromatous Type, Cutaneous Type Malignant Type)

The nodules in this type vary in size from that of a split pea to great plaques many inches in diameter Their color may be that of the surrounding skin dirty pink yellow or dark brown They are devoid of hair and sometimes lacking in sensation The presence of many nodules on the face gives rise to the so called leonine appearance New nodules may appear and the old ones soften in the center and be absorbed or ulcerate and discharge sticky pus The nose may break down its tip become depressed and a foul smelling discharge may escape from the nostrils The eyes sooner or later become attacked and destroyed Some other disease such as tuberculosis or pneumonia usually puts an end to suffering before leprosy has run its full course

Nerve Leprosy (Neural Type Benign Type)

In this form of leprosy patches of either a reddish or whitish color appear on the skin They may have a ringed appearance In other instances blisters may form The border of these patches may be sensitive but the center is anesthetic so that if the surface is pricked with a pin no sensation is felt Later other abnormalities of sensation occur such as neuralgic pains or feelings described as pins and needles There may be fever and glands may become enlarged The ulnar (funny bone) nerve and other nerves sometimes become thickened so that they can be felt beneath the skin Muscles supplied by the dis

eased nerves atrophy causing distortion of the parts and loss of power Sometimes the eyelids cannot be closed so that the eyes become hard and dry and sight is lost The nose caves in lips are paralyzed and saliva dribbles Ulcers forming on the hands and feet may cause fingers and toes to drop off In other cases finger bones are absorbed giving rise to *shortening of fingers*

Diagnosis

In doubtful cases the loss of sensation may give the needed clue The centers of patches are quite *insensitive In no other* skin disease is this definite lack of sensation found Another clue may be discovered by examining the lobes of the ears and the eyebrows for nodules and the hands for contraction with distortion of the third and fourth finger especially In the laboratory *the diagnosis can be made* by examination of the nasal discharge and by other methods

The prospect for the patient is better in nerve leprosy than in the nodular type Cases may be arrested and live for years but relapses are likely to occur Nodular leprosy saps the strength and makes the patient a prey to tuberculosis pneu monia or other diseases Galloping leprosy may prove fatal within a year from the beginning of symptoms

Prevention

Segregation and isolation of lepers is a very important meas ure especially for cases of the nodular type Those of the neural type having no discharges are not so dangerous to the community But these cases should report for examination every few months

Children of lepers should be separated from their parents at birth With this precaution they have a good chance of re maining normal but they *need to be observed frequently* for evidences of the disease Hysterical dread of casual contact with lepers is unjustified Nevertheless lepers should not be allowed to beg on the streets to frequent fairs to sell or handle food or to become servants or prostitutes

Like tuberculous *patients lepers may contaminate* their sur

roundings with their discharges and excretions Even more care is needed to prevent spread of infection through dishes and other articles used by lepers than in the case of tuberculosis

Treatment

Hygienic measures in themselves do much to improve the leper s condition Good food frequent bathing clean clothes fresh air light and agreeable work and recreation with the avoidance of fatigue are among the resources for treatment in leper asylums *Chalmoogra oil* and *hydnocarpus oil* have long been the most valuable drugs in the treatment of leprosy A preparation called *Moogrol* is given by injection

Sulfones are now the treatment of choice in leprosy These include the drugs Promine Diasone and Promizole which appear to kill the bacilli entering the blood stream preventing the spread of the disease to new areas

Many lepers need treatment for other complicating diseases including syphilis malaria or hookworm Given all available benefits Chesterman estimates that one third to one half the lepers met with in the tropics will become free from active disease Moreover the danger of their infecting other people is greatly reduced by treatment No individual who has been infected with leprosy should be discharged from observation Examinations should take place at periods of six months Relapses are likely to occur at times when the general health is poor

YAWS (FRAMBESIA)

Definition

Yaws is a chronic contagious disease closely resembling syphilis and recognized by characteristic skin eruptions

Cause

Infection by a microscopic corkscrew organism called the Treponema pertenue is conveyed from person to person by direct contact or possibly by flies

Distribution

The disease is widespread in Africa Ceylon the West Indies South America the Pacific Islands the East Indies Papua the Malay States and China

Symptoms

About two to eight weeks after infection takes place there may be fever and other general symptoms together with swelling of lymph glands

The Primary Stage Soon after the patient begins to feel ill a papule like a pimple appears on some part of the body It may be situated on the lower part of the leg thigh buttock knee arm breast lip or in other locations but seldom on the genitals This papule may be so insignificant as to escape notice but it usually persists from two to four months or even longer becoming covered by a yellow scab This is known as the mother yaw

The Secondary Stage About three months after the primary sore occurs the patient complains of pains in the joints and bones Children may suffer from diarrhea and bronchitis and look thin and anemic At this time scaly patches appear on the skin and yellowish red papules thought to resemble raspberries break out on the body They discharge a yellow material and become crusted Itching accompanies the eruption Usually sores heal in a few months but the soles of the feet and the palms of the hands may never heal properly This latter condition is known as crab yaws

The Tertiary Stage A variety of disease manifestations may follow an attack of yaws years after the initial illness Among these are chronic ulcers which may form where the bone lies near to the surface as over the shins the collar bone the bones of the forearm or the fingers Ulceration may destroy the nose and the palate

Diagnosis

A painless encrusted sore occurring in a community where yaws is common is almost certainly due to yaws The rash of

syphilis may simulate that of yaws but it is generally pinker and not yellow like the eruption of yaws and does not itch The history of a sore on the genitals or the presence of ulceration on the lining membranes of the throat favors a diagnosis of syphilis rather than yaws The two diseases cannot be distinguished from one another by blood examination or other laboratory tests

Prevention

All sores and wounds should be covered with protective dressings Systematic campaigns should be organized for the treatment of all cases It is recommended that houses or huts which are notoriously infected should be destroyed by fire

Treatment

The same drugs used in treatment of syphilis are effective for yaws Penicillin is probably the drug of choice There is an immediate and striking response to treatment by intravenous injection of neorsphenamine or mapharsen During the stage of eruption lesions disappear in the course of a few days In the early stages of the disease one dose frequently effects a cure In order to prevent relapses however it is better to give two or three injections In the later stages when the bones have become involved prolonged treatment is frequently needed Intramuscular injections of bismuth compounds are useful in treatment of tertiary lesions but are less effective than the arsenic preparations

APPENDIX A

I RECOMMENDED DAILY CALORIC REQUIREMENTS[1]

	Calories
Man (156 lb 70 kg)	
Sedentary	2,00
Moderately active	3000
Very active	4500
Woman (125 lb 56 kg)	
Sedentary	100
Moderately active	2500
Very active	3000
Pregnancy (latter half)[a]	2500
Lactation	3000
Children up to 12 yrs[b]	
Under 1 yr[c]	100/2 2 lb (1 kg)
1–3 yrs (29 lb 13 kg)	1200
4–6 yrs (42 lb 19 kg)	1600
7–9 yrs (55 lb 25 kg)	2000
10–12 yrs (75 lb 34 kg)	2500
Children over 12 yrs[b]	
Girls 13–15 yrs. (108 lb 49 kg)	2600
16–20 yrs (119 lb 54 kg)	2100
Boys, 13 15 yrs (103 lb 47 kg)	3200
16–20 yrs (141 lb 64 kg)	3800

[a] During the latter part of pregnancy the allowance should increase approximately 20 per cent over the preceding level The value of 2 00 calories represent the allowance for pregnant sedentary women

[b] Allowances for children are based on the need for the middle year in each group (as 2 5 8 etc) and are for moderate activity and for average weight at the middle year of the age group

[c] Needs of infants increase from month to month with size and activity The amounts given are for approximately 6 to 8 months The dietary requirement for some of the nutrients such as protein and calcium are less if derived largely from human milk

[1] From Recommended Dietary Allowances revised 194 (National Research Council Washington D C.) The complete table showing protein vitamin and mineral requirements may be obtained from the council It is also included

II *COMPARATIVE NUTRITIVE VALUES OF AVERAGE SERVINGS OF COMMON FOODS*[2]

Below are listed foods according to their value as sources of calcium and the vitamins indicated Foods not listed either are poor sources or their content is unknown

CALCIUM
Excellent
Navy beans
Soybeans
Soy flour
Molasses cane
Buttermilk
American cheese
Milk whole dried
  skimmed condensed
  evaporated
Red salmon canned
Shrimp canned
Green beans
Broccoli
Cauliflower
Collards
Celery
Greens dandelion
  mustard turnip
Kale
Onion
Parsnip
Rutabaga
White turnip
Water cress

Good
Almonds
Baked beans canned
Egg
Cantaloupe
Figs
Grapefruit
Orange
Strawberries
Watermelon
Beets
Cabbage
Carrots
Sweet potato

Fair
Peanuts
Pecans
English walnuts
Lima beans dried
Bread whole wheat
  enriched white
Oatmeal
Brown rice
Shredded wheat
Corn syrup dark
Brown sugar
Smoked ham lean
Round steak lean
Crab meat canned
Halibut steak fresh
Red salmon fresh
Sardines canned
Tuna fish canned
Apple
Apricots dried
Banana
Dates
Grapefruit juice
Grapes
Orange juice
Pear
Pineapple juice
Plums
Prunes dried
Raisins
Asparagus green
Brussels sprouts
Chinese cabbage
Peas green
Potato
Squash

VITAMIN A
Excellent
Butter
Cheese made from
  whole milk
Cream
Milk whole
  evaporated
Fish oils
Kidney

n *Food and Nutrition* (The American National Red Cross Washington DC) p (

[2] Adapted from Hazel M Hauck Nutritive Values of Average Servings of Common Foods (New York State College of Home Economics at Cornell University Ithaca New York) The complete table itemizing the specific content of each food may be obtained from the college A similar table is included in *Food and Nutrition* (The American National Red Cross Washington DC) pp 77–83

Liver
Egg yolk
Apricots dried
Peach
Prunes
Green leafy vegetables
Carrots
Green pepper
Pimiento
Sweet potato
Squash winter

Good

Salmon
Banana
Cantaloupe
Dates
Plums
Tomato
Asparagus green
Green beans
Brussels sprouts
Corn green
Peas
Squash summer

Fair

Pecans
Cottage cheese
Orange
Pineapple

THIAMIN (B_1)
Excellent

Almonds
Peanuts
Pecans
English walnuts
Beans dried
Soybeans, dried
Bread whole wheat enriched white
Cornmeal yellow
Oatmeal
Brown rice
Shredded wheat
Soy flour
Milk whole skimmed dried malted
Pork lean
Ham
Lamb
Heart
Kidney
Liver
Oysters
Egg yolk
Asparagus green
Brussels sprouts
Cauliflower
Kale
Peas
Wheat germ
Yeast brewers

Good

Chicken
Round steak
Halibut
Red salmon fresh
Shrimp
Egg yolk
Dates
Prunes
Raisins
Tomato
Green beans
Broccoli
Corn green
Lettuce
Mustard greens
Parsnip
Potato
Sweet potato
Spinach
Turnip greens

Fair

Rice polished
Red salmon canned
Sardines canned
Fruits (except cantaloupe pears rhubarb strawberries)
Beets
Cabbage
Carrots
Celery
Cucumber
Eggplant
Onion
Rutabaga
Squash summer winter
White turnip

ASCORBIC ACID (C)
Excellent

Liver (from freshly slaughtered animal)
Cantaloupe
Grapefruit
Lemon
Orange
Pineapple
Strawberries
Asparagus green
Green beans
Beet greens
Broccoli
Brussels sprouts
Cabbage
Cauliflower
Swiss chard
Dandelion greens
Kale
Mustard greens
Green pepper
Rutabaga
Spinach
White turnip
Turnip greens

Good

Rhubarb

Tomato
Beets
Cucumber
Lettuce
Onion
Parsnip
Peas green
Potato
Sweet potato

Fair

Apple
Banana
Blackberries
Peach
Pear
Plums
Watermelon
Carrots
Celery
Corn
Eggplant
Squash winter

VITAMIN D

Excellent

Fish oils
Milk irradiated
Cereal irradiated

Good

Butter
Liver
Flesh of fat fish
Egg yolk
Milk *fresh*

RIBOFLAVIN

Excellent

Peanuts
Peanut butter
Beans dried
Peas dried
Soybeans
Heart
Kidney
Liver
Veal leg
Wheat germ
Yeast brewer s

Good

Almonds
Pecans
Soy flour
Bread enriched white
Cottage cheese
Milk evaporated
Oysters
Beet greens
Kale
Spinach
Turnip greens

Fair

Bread whole wheat
Cornmeal yellow
Oatmeal
Brown rice
Shredded wheat
Bread enriched
Buttermilk
Cheese
Milk whole skimmed dried malted
Bacon
Meat lean
Chicken
Red salmon
Shrimp
Egg white
Asparagus green
Green beans
Broccoli
Cauliflower
Swiss chard
Peas green

III NUTRITIVE VALUE OF SOME FOREIGN FOODS*

FOOD	Weight	CALORIES	PER CENT OF RECOMMENDED DAILY ALLOWANCE						
						Vitamins			
			Protein	Calcium	Iron	A	B	C	Riboflavin
	grams		grams						
LEAFY VEGETABLES									
Amaranth tender (Lal choulai or Lal sag)	100	36–47	2.8–4.9	60	100+	50–100+	12	200	+
Amaranth spined (kante ali chowlai)	100	41	4.0	100	100+				
Bamboo shoots (Bans)	100	45	5.9	3	1	trace		4.14	
Cassava leaves	100	[illegible]		15	2	200+			
Chrysanthemum petal	100	22	2.0	8	17			100+	
Drumstick leaf (Sajna)	100	[illegible]	9	50–81	[illegible]	200	12	100+	
Leafy Vegetable Average	100	69	4.3	42	98+	+++	+	+++	++
ROOTS AND TUBERS									
Cassava roots	100	0	0.7	5				39	
Chinese turnips	100	2	1.0	5	15	trace	2	50	
Lotus root	100	13	0.4	4	12			14–67	
Taro root	100		2		5	15		poor	good
Yam elephant (Zamin kand)	100	80–92		10	5	8–9	3	trace	++
ordinary (Ratalu)	100	120	1.4	8	11		1.3	trace	+
Roots and tubers average	100	85	3	7	8		+	+	+

\+ indicates that the vitamin is present ++ indicates a good source of the vitamin +++ indicates an excellent source of the vitamin

* Bulletin No. B 84 6 New York State College of Home Economics at Cornell University, Ithaca, New York, prepared by Hazel M. Hauck, Professor of Food and Nutrition

III NUTRITII E VALUE OF SOME FOREIGN FOODS (Cont)

FOOD	WEIGHT	CALORIES	PER CENT OF RECOM ILNDLD DAILY ALLOWANCE						
						Vitamins			
			I rotein	Cal cium	Iron	A	B	C	Ribo flavin
	g ams		grams						
OTHER VEGETABLES									
Artichokes (Hattichak)	100	80	3 6	15	16	trace	3	9–30	+
Brinjal (Baingan)	*100*	35	*1 2*	*2*	*7–11*	*trace*	*1–2*	*trace*	+
Broad l eans	100	36–60	2–4	4–7	10–14	trace		15	+
Drumstick bean (Saijan)	100	26–40	5–3 8	4	7–40	4– 00			100+
Gourds bitter	100	20	1–2	1	5 18	5–16	4	100	poor
snake	100	18	1	2	J			trace	
Indian goosel erry (Amla)	100	59	0 5	6	10			800	
Jack tender (Kathal)	100	51	2 6	3	14				
Knol khol (Kohl rabi)	100	30	1 0	3	3	trace	3	100	
Kundri									
I eeks (V layaiti lasson)	100	75	1 8	7	19	20	4	19	
Plantain green (*kele ka phate*)	*100*	*110*	*1 1*	*1*	5	7	*2*	*30*	5–8
hill						2		10	
common						2		7	
Vegetable marrow	100	20	0 J	0	5	trace		3	
Water Chestnut (Singhara)	100	117	5	3	7			+++	
Other Vegetables Average	100	50	2 1	7	0		+	+	+
FRUITS									
Arbutus									
Ber (h te plum)	100					+		25	
Bread Fr t	100	9	1 5	5	5	tr ce			

Cape gooseberry (R[illegible])	100	53	8	trace	15			0	
Custard Apples									
Dates									
Cherries country (Amr[illegible])	00	65	1 5	2	9	4	trace	6 200	trace
hill	100	58	1 0	6	10	4	trace	14 24	
Jack fruit (Kathal)	100	80	1 9	3	4	11		15	1-5
Jujube ([illegible])	100	292	9	8	2			17	
Lichi	100	63	1 0	trace	4			8	
Loquat red	100	41	0 3	2	3			3	
white	100	64	0 5	4	3				
Man[illegible]es	100	0	0 8	3	4	7	7	8	1
Mangoes green (K[illegible])	100	40	0 6	1	35	5		10 +	trace
ripe (Am)	100	0	0 [illegible]	1	2	20-50	4	33 [illegible] +	2
Papaya fruit (Papita)	100	40	0 5	2	4	0	3	6	7
juice	100							0+	
Pomegranate (Anar)	100	65	1 6	1	2 14	0		19	
P[illegible] grapefruit (Chakotra)	10	8	0	5	8	4	0	10	0
O[illegible] (R[illegible])	1[illegible]	49	0 3		4			3	
Tamarind (Imli)	10	283	1 9	20	80	2		4	
W[illegible] green ber[illegible]									
Fruit average	100	8	1 2	5	10		+	++	poor
PULSES									
Cow [illegible] (V[illegible])	33	110	8 8	6	22	3 4	8-9		3
green	33	1 5	7 3	3-6	29	1	8 11	3	
black	33	108	8 4	9-3	24	1 2	7-8	2	2
Masur dhal	33	1	8 0		5	3	8		+
Mung	33	11	7 0	1	9	trace	1-6	2	2
Pulses Average	33	118	8 2	6	20		++	poor	+
SEEDS									
Bamboo seeds	16								

III NUTRITIVE VALUE OF SOME FOREIGN FOODS (Cont)

FOOD	WEIGHT	CALORIES	PER CENT OF RECOMMENDED DAILY ALLOWANCE						
						Vitamins			
			Protein	Calcium	Iron	A	B	C	Riboflavin
	grams		grams						
Sesame	16	100	3 4	20	25				
Sunflower seeds	16	100	5 0	1	6				
Watermelon seeds	16	100	3 5	5	12	poor	+	poor	+
CEREALS									
Barley (Jau)	33	112	3 8	trace	10	0	9	0	1
Maize tender (Makai or Makka)	100	82	4 3	trace	6	1		4	poor
Millet Italian (Kangni)	33	100	2–4	2	18	trace	8–11	0	poor
Ragi (Mandal or Okra)	33	115	2 5	14	15	trace	8	0	1
Rice raw—home pounded (Orwa chawal)	33	117	2 8	trace	6	0	3	0	poor
Rice parboiled—home pounded (Usna chawal)	33	115	2 8	trace	6	0	5	0	poor
Rice raw—milled (Orwa chawal)	33	116	2 3	trace	3	0	1	0	0
parboiled—milled (Usna chawal)	33	115	2 1	trace	6	0	3	0	poor
Sago (Sabudana)	33	117	trace	trace	trace	0	trace	0	poor
Sorghum—cholam (Juar)	33	1[illegible]0	3 [illegible]	1	18	trace	4	0	poor
Cereals average	33	110	2 8	2	13		+	0	poor
NUTS									
Pine nut	16	117	2 6	2	9				
Cashew (Kaju)	16	100	3 5	1	7	2		0	+

Cl esin t	50	10	25	2	7	+	o	o	o
N ts nd seeds a age	6	95	35	5	9	poor	+	o	poor
MILK									
Wat r Buffalo (Bl ains ka dudh)	200	231	86	50	4	+	+	poor	++
Goat	2 0	168	74	40	5	+	+	poor	++
CONDIMENTS									
Chillies green	100	40	29	3	11				
dry	20	0	32	4	3	10		short 200	
Tumerick	100	319	65	2	1 0	1		long 100 14	

IV REPORTED NUTRITIVE VALUE OF SOME FOREIGN FOODS[4]

(Per Cent)

FOOD	PROTEIN	CARB	FAT	CALCIUM	PHOS	IRON	VITAMINS A	VITAMINS B	VITAMINS C
Alfalfa							+++		+++
Cassava Manioc or Yuca	2	39	0	045	039	0009	+	fresh ++	
Garlic	1	9	—						
Leeks	2	8	—	0,8	0,6	0007		++	+
Mushrooms dried	4	[illegible][a]	1				±	+	—
Okra	2	7	—	07	06	.0006	+	++	
Sesame seed black	20	9	4[illegible]	1 06	0 7	04	+	+	—
Soybean sauce	2–6	5–20							
Watermelon seed	31	6	45				±	—	—

Blank spaces indicate that data are not available + indicates that the vitamin is present ++ indicates a good source of the vitamin +++ indicates an excellent source of the vitamin

[a] Little available

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V. REPORTED OCCURRENCE OF VITAMINS IN SOME FOODS USED IN FOREIGN LANDS*

Below are listed foods according to their value as sources of the vitamins indicated. Foods *not* listed either are *poor sources* or *their content* is unknown. Foods indicated "var." (variable) are listed under their higher rating and vary downward.

VITAMIN A

Excellent

Corrozo palm nut
Ki ini
Mango fresh
Palmyra fruit juice
Papaya
Persimmons (var.)
Pohas (Hawaiian Cape gooseberries)
Safflower seeds
Amaranth
Amaranth leaves (var.)
Betel leaves
Chinese cabbage fresh raw
Collards cooked
Curry leaves
Khesari leaves
Nettle dried
Pengaga
Sayor bermi
Sweet potato
Eel fat
Ghee (clarified butter fat)
Red palm oil
Opilu

Good

Gooseberry country or bilimbi (var.)
Jackfruit
Pistachio nut
Plantains (baking bananas)
Tangerines
Yellow yautia
Chinese cabbage pl[illegible] salted bran salted
Yellow Asiatic carrot
Cassava leaves
Dasheens (taros)
Ipomoea leaves
Khesari seeds
Lentils (var.)
Taro cooked
Taro poi cooked luau
Yellow yams
Goats butter
Duck eggs salted (I[illegible]lin)

Fair

Djingkol
Guava
Limes
Pummelo (pomelo pumelo)
Tamarind (var.)
Arracacia
Gourd ridge leaves (var.)

VITAMIN B

Excellent

Djengkol
Tamarind
Mung beans (var.)
Soybeans yellow
Chinese cabbage bran salted
Lentils fresh (var.)
Lentils dried
Millet seed
Brown rice
Rice bran without hulls

Good

Avocado
Coconut ripe fresh
Dates dried
Figs fresh dried
Mango fresh
[illegible]
Yellow yautia
Beans frijoles (New Mexican)
Mung beans sprouted cooked
Chinese cabbage fresh raw (var.)
Dasheens (taros)
Dhal
Sweet potato (var.)
Taro cooked
Taro poi cooked luau
Atta crude
[illegible]
Cholam
Dari

* Adapted from Bulletin No. B [illegible] New York State College of Home Economics at Cornell University, Ithaca, New York, prepared by Hazel M. Hauck, Professor of Food and Nutrition.

Indian flour pure unbleached

Fair

Candle nut
Guava
Litchi (lichi lychee)
Papaya
Soursop juice
Bamboo shoots
Mung beans sprouted raw (tagi)
Betel leaves
Eggplant (aubergine)
Mustard sarepta
Purslane
Vegetable marrow

VITAMIN C

Excellent

Beam tree white beam berries (var)
Calamandrin
Canarium
Cashew
Citron
Cloudberry
Indian gooseberry
Granadilla (var)
Guava
Hipberry fresh dried
Limes
Lime juice
Litchi (lichi lychee)
Mango fresh
Papaya
Papaya juice
Passion fruit juice
Plum Indian ber (var)
Pohas (Hawaiian Cape gooseberry)
Pummelo (pomelo pumelo)
Pummelo juice
Chinese quince fresh skin
Rambutan
Rowan mountain ash
Shaddock juice
Shaddock oil gland layer
Shaddock mesocarp
Soursop (var)
Tangerines
Agathi Katwray leaves
Amaranth stem (var)
Chinese cabbage fresh raw
Caraway new sprouts
Chinese mallow inner outer leaves
Chinese onion bulb (var)
Coriander leaves (var)
Gladiolus leaves petals
Gourd bitter
Ipomoea (kan kun) (var)
Ipomoea leaves
Iris green leaves
Lily leaves petals (white)
Lotus leaves petals juice seeds (fresh)
Lotus root (var)
Malabar nightshade (var)
Mangold leaves (var)
Mostaza leaves
Mukunuvenna
Mustard leaves
Pepperwort
Persimmon leaves
Pine needles
Poplar leaves
Purslane (var)
Wild rape leaves (var)
Wild rape stems flower
Rocambole leaves stem
Sesame seed
Shallot or scallion green stem (var)
Shepherd s purse
Talinum
Weeping willow

Good

Avocado
Balsam pear
Cactus (prickly pear)
Carambola
Carambola juice
Chicos (sapodillas)
Custard apple
Gooseberry country or bilimbi
Jambolan plum
Jujube dried
Kumquat
Mango juice
Pepino (melon pear)
Rose apple (Malabar plum) (var)
Soursop juice (var)
Tamarind
Bog vaccinium
Yang mei fruit
Agathi Katwray flower
Alibangbang leaves (var)
Mung beans sprouted cooked
Mung beans sprouted raw (tagi) (var)
Daiken (Japanese white radish) raw
Himbaoa-o flower
Lentils dried (var)

Lubi lubi
Maidenhair tree seeds dried
Makopa seeds large
Melingojo leaves
Salak
Sitao
Sweet potato (var)
Sweet potato juice
Tiger lily bulb
Vegetable marrow

Fair

Bearberry berries
Bilberry (var)
Cowberry
Kamias gooseberry
Gowok
Jackfruit (var)
Persimmon
Plantains (baking bananas)
Pomegranate fruit juice

Whortleberry (var)
Algao leaves
Bamboo shoots
Eggplant (aubergine)
Gourd leaves (var)
Lotus starch
Makopa seeds small
Shallot white bulb
Siguidillas
Squash leaves
Sunflower seeds salted
Takip-kohol
Tango
Tjermé (var)

VITAMIN D

Excellent

Eel fat

Fair

Goats butter
Red palm oil (var)
Opihi

RIBOFLAVIN

Excellent

Yellow soybeans
Rice bran without hulls

Good

Opihi

Fair

Cashew
Coconut ripe fresh
Jackfruit (var)
Papaya (var)
Plantains (baking bananas)
Pohas (Hawaiian Cape gooseberries)
Pomegranate juice
Wood apple
Ipomoea leaves
Kalo leaves
Puin sâk leaves
Sweet potato

VI COMPARATIVE NUTRITIVE VALUES OF SOME CARBOHYDRATE RICH FOODS WHICH MAY BE USED AS THE CHIEF SOURCES OF ENERGY[6]

ITEM	WEIGHT	CALORIES	PROTEIN (g)	CA	P	FE	VITAMINS			
				(% daily allowance)			A (I U)	B (mcg)	C (mg)	RIBOFLAVIN (mcg)
CEREALS										
Buckwheat flour dark	1 lb	16 0	56	6	60	45		3460	0	
Macaroni	1 lb	1635	59	13	[illegible]0	45	0		0	
Millet	1 lb	1620	37	8	111			3300	0	
Oats rolled	1 lb	1800	64	37	144	142	0	3500	0	675
Rice brown	1 lb	1615	31	47	99	75	0	2000	0	720
Rice polished	1 lb	1590	31	6	3[illegible]	38	0	100	0	360
Cornmeal yellow whole grain	1 lb	16[illegible]5	41	9	[illegible]2	35	1500	2100	0	7 0
Wheat whole grain	1 lb	1630	59	30	128	188		2500	0	6[illegible]5
LEGUMES										
Beans dried navy	3¼ oz	350	22	20	37	69	0	20	0	32[illegible]
Beans soy yellow dried	3¼ oz	350	3	30	51	56	100	1200	0	[illegible]0
Lentils dried	3½ oz	3 0	24	13	30	71	50	500	0	300
Peanuts Spanish raw	3½ oz	[illegible]00	27	9	30	19	360	1100	0	4[illegible]0
Peas green dried	3½ oz	355	25	11	30	48	0	525	0	300

Since different samples of the same food vary in composition all values given are approximate Blanks indicate that information is lacking or insufficient

[6] Bulletin No B 8459 hmb New York State College of Home Economics at Cornell University Ithaca New York prepared by Hazel M H ck Professor of Food and Nutrition

VEGETABLES										
Ca sa root	1 lb	540	7							
Ca sa a tar h	1 lb.	16 0	2							
Ca sa weet	1 lb	560	5							
P tat white	1 lb	38	9	11	20	32	180	430	0	230
S tato ellow sweet	1 lb	765	9	11	15	35	1 000	410	120	310
FRUITS										
B ana	1 lb			4	10	23	1900	210	45	300
Suggested daily allowances for a ll man at n lerat w rk*		3000	0	100	1 0	100	000	1800	15	2 00

* All wances s ggested by Committee on Food and Nutr tion National Research Council.

VII *PERCENTAGE COMPOSITION OF VARIOUS MILKS*[7]

KIND	SOLIDS	WATER	FAT	SUGAR	PROTEIN	ASH	CALORIES PER OZ
Human	11.5	88.5	3.3	6.5	1.5	0.20	18
Cow	13.0	87.0	4.0	5.0	3.5	0.70	20
Goat	14.9	85.1	4.9	4.4	4.7	0.85	20
Sheep			7.0	5.0	5.6		
Mare	9.4	90.6	1.2	5.8	2.5	0.36	13
Ass	9.9	90.1	1.4	6	1.8	0.47	14
Water Buffalo			12.6	3.7	6.0		44
Buffalo			7.7	4.4	4.8		

VIII *COMPARISON OF COMPOSITION OF SOYBEAN MILK, COW'S MILK AND MOTHER'S MILK*[7]

(Per Cent)

	CALORIES PER OZ	SOLIDS	PROTEIN	FAT	LACTOSE	NON LACTOSE CARBOHYDRATE	PHOSPHORUS	CALCIUM
Soybean milk	11	7.8	3.35	1.5	0.0	2.5	.046	.02
Soybean milk modified for infant feeding as above	18	17.2	3.35	1.5	0.0	9.0	.046	.064
Cow's milk	20	13.1	3.4	4.0	5.0	0.0	.093	.120
Human milk	18	11.5	1.5	3.3	6.5	0.0	.010	.040

Expressed cocoanut milk is high in fat (about 27 per cent) and contains about 4 per cent protein. Neither cocoanut milk nor cocoanut water are comparable to cow's milk in organic constituents or calcium and phosphorus content.

[7] *Bulletin No. A 671, rev. hh, New York State College of Home Economics at Cornell University, Ithaca, New York,* prepared by Helen M. Hauck, Professor of Food and Nutrition.

IX SOYBEAN MILK[*]

Recipe used at the Bean Mill Station Peiping China
(Courtesy of Miss Ruth M Danner)

1 Soak yellow soybeans in water for 8 hours Skim off husks discard water Add fresh water 8 lbs to each lb of dry beans

2 Grind mixture through ordinary Chinese stone mill slowly and evenly receiving the liquid in a large porcelain container

3 Strain through sieve over which has been laid a square of clean white cloth set aside the residue which may be used for adult food

4 Boil the liquid stirring constantly until it has boiled one half hour when it is ready for use

If baby has no mother s milk to 1000 cc of bean milk add

Calcium Lactate	3 gm	Starch	30 gm
Sod chloride	1 gm	Sugar	60 gm

The starch should be cooked in the bean milk The calcium lactate is added after the milk is cool to avoid curdling

The recipe furnished by Mrs J H Bright is similar except that she uses *cracked* beans soaks them in enough water to cover does not discard the water in which the beans have been soaked and grinds the beans with 6½ times as much hot water as beans (which are measured before soaking)

Recipe used by the Bureau of Home Economics Washington D C
(From Consumer s Guide *Vol III No 8 p 3 April 0 1936)*

Wash the beans and soak overnight in enough water to cover Remove skins and grind the beans very fine using a food chopper Put ground beans in a cheesecloth bag in a bowl of lukewarm water using 3 quarts to each pound of dried beans work with the hands for 5 to 10 minutes wring the bag of pulp until dry Boil the milk over a low fire for 30 minutes stirring frequently add sugar and salt to taste Keep in a cold place

[*] Bulletin No A 6 16 hml rev New York State College of Home Economics at Cornell University Ithaca New York prepared by Har I M Hauck, Professor of Food and Nutrition

Dry powdered soybean milk (as made at Pyengyang Korea)

Roast beans grind to a fine flour (crack and remove skins)

Bean flour	64 00
Sugar	14 00
Barley	9 00
Cornstarch	7 00
Calcium lactate	4 65
Salt	1 35
	100 00

Soybean milk contains only about one fifth as much calcium as cow s milk less fat and no milk sugar Its protein though of better quality than many other vegetable proteins is not equal in quality to that of animal milk It contains very little vitamin A whereas cow s milk and mother s milk are good sources

Soybean milk as modified for infant feeding should be supplemented by cod liver oil and some source of vitamin C If eggs are available egg yolk would be a good addition to this in which case the normal baby might not need cod liver oil

Feed soybean milk in about the same amounts as would be used of cow s milk If more than a liter a day is given frequent stools may result

References on soybeans

Salute the Wonder Bean *Consumer's Guide* April 20 1936

Soy Bean Dishes New and Old Special circular College of Agriculture University of Wisconsin Madison Wisconsin

Ways of Using Soy Beans as Food Illinois Agricultural Experiment Station Urbana Ill (free)

Soybeans for the Table U S D A Leaflet No 166 U S Department of Agriculture from Superintendent of Documents Washington D C 5 cents While the supply lasts free copies may be obtained from the U S Department of Agriculture

X PEANUT MILK*

The following directions have been prepared after comparing the methods used by several former members of the short course for missionaries The amount of calcium carbonate suggested in each case was 10 grams per quart This would provide about 4 grams of calcium or 1 gram per cup of peanut milk. If it is possible to provide more than 1 cup of peanut milk per child regularly the amount of calcium supplement might be reduced

1 *Preparation of peanut meal*

Shell the peanuts and dry them in the sun for several days If the milk is to be used for young babies (under 3 months of age) remove the skins first by pouring boiling water over the shelled peanuts and allowing them to stand until the water cools when the skins may be easily removed by hand

Grind the peanuts in a food grinder or pound them in a mortar Put into an oil press and remove as much oil as possible The resultant product is peanut cake Dry the peanut cake pound to a fine meal and sift until it is very light In Portuguese East Africa they use a winnower such as the native women use for separating the chaff from the grain

2 *Preparation of peanut milk*

Peanut meal	70 grams	Egg	1
Mashed banana	150 grams	Sterile water	1 quart
Calcium carbonate	10 grams		

Add the boiling water little by little to the peanut meal rubbing well after each addition so as to make a fine paste Boil for 5 minutes Remove from the stove and pour back and forth from one container to another until it is cool This process gives it the appearance of milk Add the calcium carbonate well beaten egg and mashed banana

* Bulletin No A-6 14 hmh New York State College of Home Economics at Cornell University Ithaca New York prepared by Hazel M Hauck Professor of Food and Nutrition

3 *Use of peanut milk*

For babies under 3 months of age syrup or brown sugar is used in place of banana

Treat the peanut milk as if it were cow s milk and modify it to make the desired formula except that if bananas are used no additional sugar or starch is needed

Milk sufficient for 24 hours may be prepared once a day if it is kept in a very cool place

Additions to the baby s diet
(as used at the M E Congo Mission Wembo Nyoma)

1 month	Plantain water or orange juice daily Plantain water is prepared by cooking well ripened plantains in enough water to cover until the fruit is tender Strain off the water and give between milk feedings beginning with small amounts and increasing until as much as 6 ounces daily are given
3 months	Spinach juice or cooking water from other greens
4 months	Porridge or gruel of cornmeal or rice Egg
1 year	Soups tender vegetables

Reference on Peanuts

Peanut Meal Food Value and Use (1936) Bulletin No 193 Georgia Experiment Station Experiment Georgia

XI *DIRECTIONS FOR PREPARING MILK FOR INFANT FEEDING*

(NOTE These proportions assume that the infant is of average weight In general babies should be supplied with 1½ ounces of

whole milk for each pound of body weight A child who weighs less than the average will need a little more than this One whose weight is far above the average should receive a little less Where there are no measuring glasses an ounce may be considered equivalent to two level tablespoonfuls)

Fresh Whole Pasteurized Cow's or Goat's Milk

AGE	AVERAGE WEIGHT	MILK	WATER	SUGAR	NUMBER OF FEEDINGS
up to 1 wk	7 lb	8 oz.	14 oz.	1 oz.	6—3½ oz.
2 wks.	7½	9	13	1½	6—3¾
1 mo	8	12	13	1⅔	6—4
2 mo	9	14	10	1¾	5—4½
3 mo	10	16	10	2	5—5
4 mo.	11	18	10	2	5—5½
5 mo	12	22	10	2	5—6
6 mo	14	26	10	2	5—7
7 mo	16	31	10	1¼	5—8
8 mo	17	32	9	1⅓	5—8
9 mo	18	32	8	1	5—8
10 mo	19	Milk whole		0	4—8

Evaporated Milk

AGE	MILK	WATER	SUGAR	NUMBER OF FEEDINGS
Up to 1 wk.	6 oz.	15 oz	1 oz.	6—3½ oz.
2 wks.	7	15	1½	6—3½
1 mo	8	16	1½	6—4
2 mos	9	16	1¾	5—4½
3 mos	10	16	1¾	5—5
4 mos.	11	20	2	5—6
5 mos.	12	21	2	5—6½
6 mos.	13	22	2	5—7
mos	14	21	1½	5—7
8 mos.	15	20	1	5—7
1 mos.	16	19	½	5—7
12 mos.	16	16	0	4—8

XII *HEIGHT AND WEIGHT TABLES* [10]

MEN

HE GH	19 YRS	Y	– Y S	3 4	5 9 YR	30–34 YRS	35–39 YRS	40–44 S.	45 49 S.	5 54 Y S	55 5 S
5 ft	107	1	4	8		6	1 8	3	33	134	13
5 ft. n		5	1 8		4	8	13	133	35	36	37
5 ft	1 7		2	124	1 6	3	3	135	137	38	139
5 ft 3 n	1	4	6	8	1 9	33	135	38	140	41	14
5 ft 4 n	4	7	1 9	3	33	36	138	4	143	144	145
5 ft 5	8	3	3	134	37	4	142	45	47	148	149
5 ft. 6	3	133	36	38	14	44	46	149	5	15	153
5 ft. 7	36	37	14	4	145	148	15	153	55	156	158
5 ft 8	4	4	143	146	49	15	155	58	6	16	163
5 ft 9	44	45	47	150	53	156	6	63	165	166	68
5 ft	148	149	5	154	57	6	165	168	17	17	173
5 ft	53	54	56	59	16	66		74	176	177	1 8
6 ft.	58	6	162	165	167	7	76	18	18	83	184
6 ft n	63	65	167	1	73	78	82	186	88	9	19
6 ft	68	7	73	76	79	184	89	193	95	97	98
6 ft 3	73	175	78	18	84	19	95			4	205
6 ft 4 n.	78	8	83	86	89	196		6	9		2
6 ft 5	83	85	88	191	94		7	12	5	7	9

BOYS

H K I he	5 RS	6 YR	7 S	8 RS	9 RS.	1	YRS.	Y S	3 YRS.	4	5 Y S	16 Y S.	7 YRS.	8 Y
39	35	36	37											
4	37	38	39											
4	39	4	4											
42	4	4	43	44										
43	43	44	45	46										
44	45	46	46	47										
45	4	47	48	48	49									
46	48	49	5	5	5									
47		51	5	5	53	54								
48		53	54	55	55	56	57							
49		55	56	5	58	58	59							
5			58	59	6	6	6	6						
5			6	6	6	63	64	65						
5			6	63	64	65	67	68						
53				66	67	68	69	7	7					
54				69	7	7	7	73	74					
55					73	4	75	76	77	78				
56					77	78	79	8	8	8				
57						8	8	83	84	85	86			
58						84	8	86	87	83	90	9		
59						87	88	89	9	9	94	96	97	
6						9	9	93	94	97	99	1		
6							95	97	99	1	4	1 6	8	
6									4	6	09	1 1	3	6
63							5	7	9		1 4	5	7	1 9
64								3	5	1 7	8	1 9		2
6									1	2	23	4	5	126
66									5	6	7	8	9	3
67									3	13	3	133	34	135
68									134	35	136	37	35	39
69									38	39	4	4	4	43
7										14	44	45	46	4
7										47	49	15	15	151
7										5	54	55	156	57

[10] From J F Will ams M D *Personal Hygiene Appl ed* (W B Saunders Company Philadelphia) p 18

WOMEN

n y	9 y	a yr	a s	3 4 y s.	5 9 s.	30–34 rs	35 37 rs.	40–44 y	45 43 y	50 54 s.	ns.
4 ft. 1 in.	98		46	1	1 3	6	9	3		9	
4 ft. 1 in.	3	107	09	1	15	8			8	3	
3 ft.	109	11	113	1 5	7	1	3	7	2	33	
3 ft. 1 in.	3 3	115	116	118	9	1	5	9	3	33	
3 ft. 2 in.	216	218	219	1		24	7	3	35	35	
5 ft. 3 in.	1	1	12	3	1 4	27	3	35	35		
3 ft. 4 n.	3 2	1 4	25	6	1 8	3	3	35		44	
3 ft. 3	6	1 7	8	1 9	3	34	35	4	5	8	
3 ft. 6 in.	1 9	3	53	133	35	38		4	43	54	
51 7 in.	3	33	135	37	39	14		5	33	56	
5 ft. 8 n.	35	37	130	4	43	40	5	54	57		
3 ft. 9 n.	38	24	24	43	147	3		58		1 5	
3 ft. in.	4	43	45	48	5	54	15	6	4	69	
3 ft. 1 n.	45	147	49	5	3	57		4	68	3	
6 ft.	15	5	54	150	58		63	7	7	4	

GIRLS

In inches	5 y	6 yr	7 s.	8 y s	9 s.		s.		3	4 rs	5	s	6	3 y
39	34	33	36											
4	36	37	38											
4	38	39	4											
	4	41	4	43										
3	4	4	43											
4	44	45	43	46										
5	46	47	47	48	49									
49	45	43	49	50	5									
7		49	5	5	5	53								
48		5	5	53	54	55	56							
43		53	54	55	55	57	58							
3			53	27	58	59	60	6						
5			59	6	6	62	63	64						
52			6	63	64	65	66	67						
55				66	67	68	68	9	7					
54				68	69			7	73					
53					72	3		73	76	7				
56					76	77	78	79	8	8				
57						8	82	83	8	85	86			
58						85	86	87	88	89	9	9		
9						89	9	9	93	0	95	9	93	
60							9	95	97	99	or			100
5							99				6	3	9	
62							4	06	7	9		5	4	7
63							09		1	3	5	7	8	6
6								5			9	[illegible]		
63												3		5
66								9			4		27	1 8
67										6		4	28	3
8									6	5	3	3	33	3
69									9	2	33		36	37
7										3	3	3	3	
71										39	4		3	4
72											43		4	9

APPENDIX B

I INFORMATION ABOUT COMMUNICABLE DISEASES[1]

DISEAS	SOU CE O N CTION	TIME FROM EXPOSUR O FIRS SIGN	EARLY SIGNS	P IOD DI AS MAINS COMMU C	C MM N COMPL CA TIONS	PREVENTIVE M SUR S
Ch k pox	P m bly f ct g t p t the o s of kin and re p t y t act	2 to 3 w ks	U lly l ght f e at th t m f p p r e f rup t wh h look l k m ll w t bl ster found n ll p rts f th body	F om th t f the d sease t about 6 days aft r th first rupt ns t mo e than 10 d ys	Sk n rup t o may become f cted w th other germ	No mm zat on a a lable Av d x po e Alm t ry ne t kes the d after expo-
D phth	I d sch ge f m the n th t d y th r m m mb t n g th g rm	U ually t 5 d y S me t mes lo g	A t fl mm t on pe lly f the ton ls th t d n se accomp n d by p t h of g y h wh t m mbr e	V abl nt l g m of the d se h d ap p a d U u lly 2 we ks 1	P ly f h rt a d th at m s l s	Imm t n l ble All h ld n ho ld b mm d g n t d ph th t g m th f g Th S h k t t h uld be g 6 m ths lat t d t m e wh ther t tm t h s be n ff ct If t oc l t n h uld b p t d
C rm n m l	S t s f th m th d th t d p bly f the	4 t d y	Sl ght gn f ld f t d y f l l wed by d h on f d body	F m th fi t gn f th d f t l t 4 d y d lly t m th n 7 d y	N lly	N mm t l bl H ghly mm icabl M t h ld n t k th d d g p d m

F om Lona L Trott *Red C o s H m N* g (The Ame c n Nat on l R lCro W h gton D C) pp 405–408

Infantile paralysis	one and ... of infected persons and carriers, or articles recently soiled by them. Bowel discharges ... contain the germs.	... to ... days.	Mode of ... ally ... part ... be ... cons ... pation, drowsiness, irritation, and ... fine ... neck ... pine ... ly ...	Not ... known. Apparently ... for onset ... first week ... two of the disease	... affected part of the body	... other ... necessary contact with ... people ... home ... Isolation of ... children with ... immediately
Smallpox	... bably ... discharges from nose and mouth of infected persons and articles freshly soiled by such discharges.	Short usually 4 to 7 hours.	Sudden onset ... days ... back ... limb ... nose ... sore throat	Not known possibly during the early ... acute and ... con... the disease	... mon ... the ... F ... weak ... persist ... weeks. Men ...	... valuable ... should be ... during the ... of the disease ... avoid ...
Measles	... and nose discharges.	About ... days, may be long ... day ... when convalescent serum has been given ... prevent ... me	F ... cold ... throat ... mouth. Red rash ...	From ... day before ... appears ... day ... the ... pe	P ... mo ... inflammation ... passage.	Immunization ... with blood serum ... whole blood ... children who have had measles. Avoid contact with sea.
Mumps	Secretion of the mouth and possibly of the nose	... 6 days. Most common period ... days.	... swelling ... gland ... front of ... below the ...	Probably begins ... day before ... swelling ...	Inflammation of sex gland ... children ... adults.	No ... immunization. Avoid ... exposure

I INFORMATION ABOUT COMMUNICABLE DISEASES (Cont)

S	O F C N	TI OM P R O S N	A LY SIGNS	ER O D SEASE EM INS COMMUN CA LE	COMMON C MPL CA TIONS	PREVE TIVE ME SURES
P m (Lob)	P b bly d h g f m the m th d f f t d p wh h th d t l f bly l d w th h d h g s ca	B l eved t be f m 1 to 3 days	S dd n s t w th h ll f ll w d by f ft n p n th h t u u lly gh d d ffi lt b th g	Not k wn th ght t t t l th d ch g f th mouth d n no lo ge ry the fe t ag t	Pleurisy P ch t cav ty H art d	No mm t n Avo d cont ct w th a d p l ng d p u t e e w ther
S l t F r or S l t a	D h g f m th n th t w d r ski t t f s k or l t p t t art l l d used by p t t C rr s m y al sp d th d e	t 7 d y U lly 3 t 4 d ys	S dd t w th a m t g fe r and e th o t d h n nd or 3 d day ft et	U lly t l 3 w k fte th d e t t U t l ll d h g d ll p n w d h h l d	Infl mm t n f th m d dle D m ge to h t and k d ey	Imm t n of x p d h ld n w th sca l t fever t t or l t um f doct ad b t w ll o ly p of t ab t 12 d y Av d c ta t Isol t n to p nt sp ead of d
S pt So e Th t	The h m d th t p ges, u ally th t l The udd f w f t d by th m lk mm n so f fect n	1 to 3 d ys	A t e th t ap p r g p d mic tb ks O t pt t be dd n w th a l ll h gh t mp tu h d h d m t g	In m p m bly a l ng th e a y gn f the d Th n t g m y f ll w l d l t f m t m	I f t d d nl g d gl ds of tl k M ddl f t n A th t H rt d K d y d se	N mm t n Avo d f I l t n f th d g t t g f d se d le d p rt ul ly t f p t t f m p rt p t th p d h dl g f m k o m lk p od t Art l l d w h d sch g f m tl d h f p i t h ld be d f t

T achoma	Secret on nd d a ha g f om the yes d y l l f i fected persons.	N t know	Ch l flamm o f the y d y l d w h f n t f gra t ion.	A long the l on d d scha g f m h l ons.	S ue d f m y f y l l d of me t f th y t self som t m l d i g t tl d s.	N imm i tl n. F l m f pat t from hool l se Isolat f pat t i t nece sary f h p pe ly tre t d d t t d in p ec t g t p d f h e t on t th y t th by mm se f re s. l d f omm n i l ty pp re tly may be hort d by pp p t t ime t
Typhoi l Fev	Bow l d ha ge d tri f f ct d di idual Ca s.	3 38 day I ally not m tha ways.	II f h w k d ont ued f g l body d bance d h a.	F m he ppe f mpt m h gh t h ll f l pse d g co l m t t pe ted m on l sh d h g h w on t u bse t typho d g ms.	H m h ge f m l k i th i t t l wall B m h t d p m s.	Imm n t ll wh h prot ct f pl l ly a y ff mfe a f the h sehold h l se se h ll be mmt l lf th y h e of l ly h d typh il P otec on nd p i fi t f t) w t r pply pa l t f the m lk p ply S t y dis posal f h man ret

I INFORMATION ABOUT COMMUNICABLE DISEASES (Cont)

D SEASE	SOURCE OF INFECTION	T M F OM EXPOSU O PIES S N	EARLY S G S	P DD SE MAINS COMMU ICA LE	C MM N COMPLICATIONS	PREVENTIVE MEASURES
Whoop g Co gh	D h g s f m th th t f a ı f t d person	7 to 6 days.	An cute f ct n n d ng th t h a d br nchi m p d by a typ al ugh lly l st ng from ı t 2 m nth I t t g gh at t d whoop g d l p w th n ı to 2 w k	Us lly l t f m th set of the d for abo t 3 w ks.	B h t Br ho pneum n a	Immu z t n ava la bl b t t ll in the exp m ntal stage It of part l r mpo t nce to p o- te t h ld n u der 3 yea s f m tle d s a Ch ld w th d e s hould b s pa t d from th r ch ld n and x cl d d from hool a d publ c pl f t le t 3 w k
C mm n C ld	D harg f m m th d e of ı f t d pe	P ob bly be tw n ı d 48 h P bly as l g 7 h u	A t fl mma t f th pp p t y t t U lly l ght f d h lly sa t s n fi t d y R g no e d y y ha e so e th t d gh	Th ght to b l m t d t th ea ly t ges f th d s- se P b bly no l g r th n a w k	So th t b h t p m n f ct d s h n nus fect n	N mm t on A o d e t t w th pe s wh h ve c ld Isol t n f t d d d t a d p ent sp d of d h g s
Imp t g Con t g o a	E pt th k n f th f t d pe on.	N t kn wn b t lly w th in 5 d y d oft n w th n 2 day	A d t n f th k h t d by p t l d b c t m m ly n f d h d b t m y p p body	A l g th p t l m h l d d b p t	S d y f t f th k nd p d t th p t f th body	N mm at on H ghly mmun a bl A d c t t w th f ct d a S p t p t nt f m th t p v t p d K p- g th k l n d good d l h l d h d se

[illegible] Foot or [illegible] f this (out)	[illegible] bodies f [illegible] pe [illegible] be [illegible] ed ha bed by i vidual nd k l ed i damp plac ril le f loth g oilet rt les, ba h bs, how s, d wim- mi g pools.	Not [illegible]	[illegible] sca p he body he feet, or he groins depend on wh h form f fection i ls.	[illegible] he led. [illegible]	[illegible] per [illegible] nd f long d t.	[illegible] Avoid con ac w pe som ha he d se se A oid w lk g l ba feet md [illegible] pool how ba h p bl plac s. Keep th kl 1 d dry p rt cu- l ly be wee th toes. Ch ld en a m re pt to ha r gwo m f lp I d body Ad s m pt t ha r gw rm f f et
Sc bies (i h)	P son ha bo g the h m h k bu w pa t l ly bet een h fing s.	4 t 8 h s. Length f me t t k t h m t bi w l the k n, l y ggs, d t t h g	I h g sensa on. Later s m t m l fl mm t d t rr t on d see onda y fect	U t l th it h m t s d ggs de- st y d	Seco d y i fection a d f fl mm t l glected	N mm t o H ghly comm c bl Avo d co tact th ses, d lth body l h g d bedd g batht b r h s, art l sed l y f t d pe son. Keep k l d l good co d t l p t th m te from ha g opport ty t pe t t th l a.

I INFORMATION ABOUT COMMUNICABLE DISEASES (Cont)

DISEASE	SOU CE O INFECTION	TIM M EX SURE TO ST S GN	E Y S GNS	P S SE MA NS COMMU ICA LE	C MM N COMPLICA TIONS	P E IVE MEASURES
Wh p g Co gh	D s ha g f m the th at of n f ted p on	7 to 16 d ys.	An acut f t on m ad g th t hea nd b n h com pa d by typ cal cough lly last ıng f m to 2 mo ths I r t t g o gh t n t and whoop g de lops w th n r t w ks	Usu lly l t f m the t of the d for abo t 3 w ek	B h t s Bron ho pneum n a	Immu i t v l ble b t t ll ın the exp m t l tage It f pa t c l r imp t n e to p o-tect h ld u d 3 years f om tle d e se Ch ld w th d eas h ld be sep rat d f m other ch ld n d ex cl d d fr m school a d p bl c pl c s f t le st 3 w k
C mm n C ld	D h ge f om m th d n of nf ct d p so	P b bly b tw n a d 48 h s P bly l g as 72 ho	An ac t fl mm t o of th pp r p to y t t U lly l ght f a d h lly s sa t on fi t d y R g n a d y m y h ve th t d gh	Th ght t be l m t d t the ly t g f the d se P b bly no l g th n we k	S th t b h t s p m n f ct d rs h n s nu n f t n	N ımm t A o d c t t w th pe wh h ve c ld Isolate n f t d i d d t and p event sp d of d h ges
Impet g Con t g	E pt on th k f the i f ct d pe n.	N t k wn but lly w th 5 d y d oft n w th n d y	A d t n of th k n h t d by p t l d b ts m m ly n f d h d b t m y p-r body	As l g the p t l m u h l d d bs p t	S d ry f t f th k d p d t th p rt f th body	N mm n at n H ghly comm bl A d t t w th f ct d S p t p t ent f m th t p v t p d K p-g th kl l n d good d t n h l i d h d se

Ring wo[r]m of the Body Feet (Athletes foot)	f pt on om [i]l er le ves f i o ed pe on h scal nd ha hed by i d vid l d lodged l damp pla rt l f loth g toilet rt les, bath ba, showers, nd sw m m g pools.	Not known.	b on he sc lp he bod he fre h g ol depend g on whi h f rm f i fect on t is.	U l he rupt on he led	None t y pe ent d f long draw t.	mm on ld om se w h pe son h g h d se se l w lk i g in ha feet d w mm g pools, b bath p bl c plac Keep th sk l d d y p rt la ly between th toes. Ch ld en so apt t h ve i gw m f calp f d body Ad lts mo pt t h gw rm f foo
Sc bies (i t h)	P son ha bor g the h m t the k b rows, p cula ly between the f gers.	4 t 8 h s. Leng h f t me t t k h m t bu row nd the k l y gg d rt t h g	It h g se sat on. I somet mes i fl mm d t d sec- ondary fect on	U t l the t h m t a d gg de- st yed	Seco d y i fect a d i fl mm t on l n gl t d s.	mm t H ghly comm tl A md t rt w h se d th body loth g d bedd g bath h h w s, o rti l sed by i f ted pe son. Keep kin l l l good co d t p t th t from ha g opport ty t penet t th k n.

II *TEMPERATURE ACCORDING TO CENTIGRADE AND FAHRENHEIT*

C	=	*F*	
0°	=	32°	Freezing point of water
37°	=	98 6	Normal body temperature
40°	=	104	Considered a high degree of fever
6 7°	=	145	Pasteurizing temperature
100	=	212°	Boiling point

To convert Centigrade to Fahrenheit degrees multiply the centigrade reading by 9 divide by 5 and add 32

To convert Fahrenheit to Centigrade degrees subtract 3 multiply by 5 and divide by 9

Equivalent Temperatures

C F	C F	C F	C. F
36 0—96 80	37 4— 99 32	38 8—101 84	40 2—104 36
36 1—96 98	37 5— 99 50	38 9—102 0	40 3—104 54
36 —97 16	37 6— 99 68	39 0—102 20	40 4—104 72
36 3—97 34	37 7— 99 86	39 1—10 38	40 5—104 90
36 4—97 52	37 8—100 04	39 —102 56	40 6—105 08
36 5—97 70	37 9—100 22	39 3—102 74	40 7—105 44
36 6—97 88	38 0—100 40	39 4—102 9	40 8—105 80
36 7—98 06	38 1—100 58	39 5—103 10	40 9—106 16
36 8—98 24	38 —100 76	39 6—103 28	41 0—106 52
36 9—98 42	38 3—100 94	39 7—103 46	41 1—106 88
37 0—98 60	38 4—101 12	39 8—103 64	41 2—107 4
37 1—98 78	38 5—101 30	39 9—103 82	41 3—107 60
37 —98 96	38 6—101 48	40 0—104 00	
37 3—99 14	38 7—101 66	40 1—104 18	

APPENDIX C

I SUPPLIES FOR TIMES OF ILLNESS

(These are intended especially for places where such provisions cannot be secured locally)

An extra supply of bed linen to allow for frequent changes

Tools for the sick room

3 tested clinical thermometers for use in the mouth
2 tested clinical thermometers for use in the rectum
4 medicine droppers
1 rubber hot water bottle [1]
1 metal hot water bottle (This will be useful after the rubber one deteriorates)
1 rubber ice bag
1 rubber fountain syringe (enema bag) with assorted nozzles (Fountain syringe and hot water bottle can be secured in combination)
1 soft rubber bulb for syringing ears or giving enemas to babies
1 small sized rubber catheter
A four-ounce funnel which can be attached to the open end of the catheter for giving high enemas to babies.
2 bed pans
A pair of scissors
A pair of splinter forceps (tweezers)
Box of wooden tongue depressors (a spoon handle can be substituted)
Box of wooden applicators for making swabs (any clean stick or a long hair pin straightened out can be made to serve)

[1] A rubber hot water bottle should be dried inside and out, blown up and stoppered when not in use An ice bag or enema bag can be stuffed lightly with tissue paper Before being packed rubber articles should be powdered with chalk or talcum powder and wrapped in tissue paper A catheter should be powdered, wrapped in tissue paper and kept in a small tin box if it is new When not in use rubber appliances should be put away in a trunk or tin box with a well fitting lid in order to protect them from contact with the damp atmosphere

4 half pound packages of sterile absorbent cotton
1 dozen sterile gauze compresses in envelopes (3 x 3")
1 dozen sterile gauze compresses in envelopes (4 x 4")
6 sterile gauze roller bandages (width 1 inch)
6 sterile gauze roller bandages (width 2 inches)
6 sterile gauze roller bandages (width 3 inches)
2 ace bandages No 1 for sprained ankles etc (width 1½ or 3 inches)
Adhesive plaster 1 roll (3 inches in width) A large supply is not recommended since it loses its adhesiveness in a hot climate The plaster can be torn into strips of the desired width at the time of use
2 triangular bandages made from a square yard of muslin These will be useful for slings and for first aid bandages

Invalid foods for the emergency shelf

Saltines or cream crackers
Vanilla wafers arrowroot biscuits or other simple sweetened biscuits
Beef extract or bouillon cubes
Vegex for making vitamin broth
Canned fruit juices (where fresh oranges and other fruits are not available)
Canned peaches and pears
Dried prunes and prune juice
Gelatine flavored or unflavored for desserts
Junket tablets
Corn starch
Barley flour for making barley water or gruel
Tapioca or sago
Macaroni vermicelli or spaghetti
Rice
Cream of wheat semolina or farina
Pablum (or similar baby cereal)
Strained and chopped baby vegetables in cans (where these are not easily made locally)
Cocoa
Malted milk
Evaporated milk in cans or Klim or Dryco (when the supply of fresh milk is limited)

Lactose (1 lb) This is milk sugar mentioned in the fluid diet on page 93

Butter in cans if not available locally

Vitamins and other accessory foods

(The amounts given are suggested as emergency supply only)

Ascorbic acid (vitamin C) 100 25 mg tablets[2] In time of illness these tablets may be taken separately or added to fruit juice or jelly in order to increase the nutritive value of a restricted diet

Thiamin hydrochloride (vitamin B) 100 1 mgm tablets Two of these tablets supply more than the required daily allowance for times of health They may be given in tablet form or crushed and added to soup or cereal

Calcium lactate 100 6-grain tablets Useful when sufficient milk cannot be taken as a source of calcium

Mixed vitamin pills or capsules such as Trapadin or others made by reliable firms package of 100 To be used as an aid to convalescence or to supplement a diet inadequate in vitamins as for those who are dieting for weight reduction 1 pill daily is sufficient

Halibut *liver oil capsules packages of 100 1 to 2 daily for con*valescence from severe colds These may be used also for the needs of older children who are underweight and for expectant and nursing mothers To supply vitamin D as well as vitamin A halibut oil is available fortified with viosterol

Aqueous concentrates of vitamins A and D (These will not become rancid in hot weather) A few drops daily may be used for babies as a substitute for cod liver oil Drisdol is such a concentrate of vitamin D and Drisdol with vitamin A is also available

Iron for anemia

Tablets of ferrous sulphate (or Feosol tablets) One or two tablets may be taken by adults after meals and at bedtime Older children in proportion

Elixir of ferrous sulphate (or Elixir of Feosol) especially suit

[2] The recommended daily allowances for ascorbic [illegible] men [illegible] mg women [illegible] mg [illegible] 16-20 years [illegible]

able for small children who cannot swallow tablets Adult dose 2 to 3 teaspoonfuls in water three times a day Children should take 1 to 2 teaspoonfuls in water three times daily *between meals* For infants begin with 20 drops daily (given between feedings 5 drops at a time) The amount is to be increased gradually until two teaspoonfuls are taken in the course of the day Administer in water or mixed with fruit or vegetable juice preferably through a tube

Medications usually available in kitchen supplies

Bicarbonate of soda (baking soda) 12-ounce can

For treatment of burns

For insect bites

Internally for discomfort in the stomach Dose ½ teaspoonful in a little water

Powdered Mustard 1 pound

For a *mustard bath* or *pack* in treatment of convulsions in children Such treatment is not recommended in the presence of high fever [a]

Directions for giving a mustard bath or pack Add 1 table spoonful of mustard to each gallon of warm water (100°–103° F or 38 –39 5 C) If no thermometer is available test the water with the elbow It should be warmer than the elbow but not hot

For a mustard bath bathe the child in a tub of the mustard water until the skin is reddened At the same time apply cold to the head Afterward wrap the child in a light blanket

For a mustard pack which is preferred by some doctors place the child on a blanket and then wrap him in a bath towel wrung out of the mustard water prepared as above Apply cold to the head Remove the pack after 10–15 minutes

NOTE For treatment of convulsions warm water may be used if desired without the addition of mustard

For mustard plasters These may be applied to the chest and back for a cold in the chest or to the pit of the stomach to allay vomiting

Directions for making a mustard plaster Cut a piece of muslin twice the size of the surface to be covered by the plaster

[a] Whether or not the child in convulsions has a high temperature an enema of soapy water may be given For an infant ½ to 1 glass of soapy water may be injected using a catheter and funnel

Make sufficient mustard paste to cover half the muslin using 1 part of mustard to 2 3 or 4 parts of flour the degree of dilution depending on the sensitivity of the skin For example to make a plaster for an infant s chest mix 1 teaspoonful of mustard powder with 4 teaspoonfuls of flour and stir to a paste with a little *cool* water

Spread the paste on one half of the muslin to v ithin 4 inch of the edge Then fold over the other half

Warm the plaster before applying it This can be done by *carrying it to the patient between two plates which have been warmed for the purpose*

Leave the plaster in place until the underlying skin is deep pink as in sunburn This may take only a minute or two in an infant or as much as 30 minutes in an adult with a thick skin *Never allow blistering to occur If the skin seems very sensitive on removal of the plaster apply oil or vaseline*

Table salt (sodium chloride) 1 package

For gargling or the irrigation of sore throats 1 teaspoonful of salt to a pint of hot water (see chapter 15)

For hot wet applications to inflammatory swellings 3 heaping tablespoonfuls of salt to a pint of hot water (see chapter 15)

A very dilute solution swallowed lukewarm for inducing vomiting Glass after glass may be needed

Salt solution in the strength of teaspoonfuls to a pint of water may be used as an enema When a patient vomits all food or drink taken by mouth 8 ounces of this salt solution may be injected into the rectum to be retained

Useful drugs for the medicine closet (to be kept locked and out of the reach of children)

Laxative tablets such as Phenolax wafers containing 1 grain of phenolphthalein pleasantly flavored and scored for division These are suitable for *occasional* use by adults and children (in doses proportionate to age) They may be injurious if used continually

Epsom salt (magnesium sulphate) 1 pound can

As a purgative Adult dose *1 to 2 tablespoonfuls in* just enough water to dissolve the crystals For the best effect take on an empty stomach and refrain from drinking water until after the bowels have moved

(Warning Do not give this or any other laxative medicine in

the presence of abdominal pain and tenderness which may b due to appendicitis or other inflammatory conditions in the ab domen

Externally as a local application using a solution of si heaping tablespoons of the salts to a quart of water (1) Used cold thus makes a good wet dressing for poison ivy or simila irritations (2) Used lukewarm (preferably) it may be applied in wet dressings for burns (3) As a hot solution it is useful fo soaking inflamed parts of the body or in preparation of we compresses to aid in ripening abscesses or boils In snake bit it is used for wet dressings to be wrapped about the limb be tween periods of suction

Milk of magnesia 8 ounce bottle in liquid form or 100 tablets each equivalent to 1 teaspoonful

As a laxative In liquid form 10 to 20 drops may be mixed with a bottle feeding for a baby of 3 to 5 months Adult dose 2 to 4 teaspoonfuls

To relieve sour stomach Take in same dose as for laxa tive

Mineral oil This should not be used habitually since it robs the body of fat soluble vitamins In emergencies it may be used as a lubricant to the bowels for constipation One teaspoonful may be given to a baby or 1 tablespoonful may be given to an adult

Castor oil two 8-ounce bottles Dose for an adult 1 to 2 table spoonfuls Dose for a small child 1 teaspoonful

For diarrhea to remove offending food After this action it has a constipating effect *Never use castor oil in treatment of constipation*

To drop into the eye when irritation occurs from foreign bodies Mineral oil may be used for the same purpose

Bismuth subnitrate (or subgallate) *Powder* 8 ounces For diarrhea which continues after the patient has been treated with castor oil and a liquid diet Dose ¼–½ teaspoonful for an adult repeated every 4 hours for several days if necessary Bismuth causes the faeces to become black

Kaolin 8 ounces Useful for chronic diarrhea Dose 1 to heaping teaspoonfuls stirred into ½ to 1 glass of water Repeat at 4 hour intervals

Paregoric (camphorated tincture of opium) 4 ounces Adult dose for relief of pain 1 teaspoonful

Pain relieving doses for children according to age

Age 1 month	1 drop	1 year	5–10 drops
3 months	2 drops	5 years	30–40 drops

After 5 years increase the dose gradually until at the age of 12 the adult dose is given

Cough-quieting doses For an adult 15 drops Children in proportion

Uses of paregoric

To relieve intestinal colic after the cause of the pain has been removed by castor oil (Not to be used for habitual colic in babies)

To relieve suffering in children during the course of acute illness One pain relieving dose may enable a child to go to sleep

To quiet an incessant cough The dose may be repeated every 3 hours while needed but its use causes constipation

Tablets containing aluminum hydroxide such as Creamalin or Amphogel used for cases of ulcer of the stomach or duodenum and also useful for undiagnosed discomfort occurring habitually about 2 hours after meals Two tablets are to be chewed and swallowed with a glass of milk or water

Syrup of ipecac (or wine of ipeca) 1 ounce bottle

For croup in children Dose 5 drops for a baby of a year or under Dose increases with age up to 10 drops repeated in an hour if necessary (see chapter 13)

As a loosening cough medicine for use when the patient cannot expectorate freely Dose for children as for croup For adults 15 drops may be tried An overdose produces nausea It may be necessary to repeat the dose several times at three hour intervals but when the secretion has been loosened this medication should be stopped

To produce vomiting (as in the case of poisoning) Dose for this purpose for a child ½–2 teaspoonfuls for an adult 1–4 teaspoonfuls

Tablets of codeine 100 ½-grain tablets *A narcotic not to be used unnecessarily*

For *incessant coughing* Adult dose 1 tablet every 4 hours. This should be discontinued as soon as the patient can rest without it

For severe pain which cannot be relieved by aspirin give 1 to 2 tablets and repeat after 2 hours if necessary For children's doses, see page 97

Tablets of phenobarbital 100 ½ grain tablets This is habit forming and should be used only in times of special need

For insomnia One tablet repeated after 2 hours if necessary Not to be used habitually

For great excitement or nervousness As above

For delirium 1½ grain repeated after 4 hours if necessary

Aspirin Bottle of 500 5 grain tablets For headaches and other aches and pains and for sore throat Dose 5 to 10 grains according to the severity of pain After this 5 grains can be given every 4 hours until relief is obtained If aspirin causes discomfort in the stomach each dose may be accompanied by ¼ teaspoonful of bicarbonate of soda

Aromatic spirits of ammonia 4 ounce bottle For faintness or whenever a stimulant is needed (Never give in the presence of severe bleeding) Dose ½ to 1 teaspoonful in a little water

Tincture of Zephiran 4 ounces

Tincture of iodine 2 per cent Four one ounce bottles with glass rod attached to rubber stopper For local application as an antiseptic for wounds

Cresol 1 gallon of 2½ per cent solution LABEL POISON *For disinfecting faeces and urine* from infectious patients Add in amount *equal to the discharges and let stand one hour before disposal*

Blue tablets of bichloride of mercury bottle of 25 7⅓ grain tablets LABEL POISON *These are very poisonous and must be guarded carefully*

To make a disinfectant for the hands Dissolve one tablet in a quart of water (a 1 1000 solution)

For preparing wet dressings for infected surfaces as in treating boils (1 1000 solution)

Potassium permanganate tablets 100 5 grain tablets Solutions must be freshly made 1 tablet dissolved in a quart of water makes a 1 5000 solution This may be used for many purposes among them

For application to bad spots of prickly heat or for soaking the feet in acutely inflamed cases of *athlete's foot*

For washing away foul smelling discharges It is good for use in syringing ears having a foul discharge

Ethyl alcohol 1 quart of 70 per cent solution

For disinfecting the skin as in preparation for hypodermic injections

For rubbing the back (dilute with an equal part of water)

Boric acid powder (boracic acid), 1 pound.

As an eye lotion, made by dissolving 1 teaspoonful in 4 ounces of boiled water.

In the same strength, applied in the form of cold compresses in treatment of irritated conditions of the skin.

Zinc sulphate eye drops (1 grain of zinc sulphate to the ounce of distilled water).

For conjunctivitis, especially "pink eye."

Argyrol, 1 ounce of 10 per cent solution. The solution must be fresh in order to be effective.

As eye drops for eye infection.

For swabbing the throat.

or

Lunargen capsules, 12 capsules. One capsule dissolved in a small bottle containing 1 teaspoonful of boiled water makes a *fresh* solution for use in place of argyrol.

Paredrine hydrobromide aqueous, 1 ounce. As nose drops, to shrink the mucous membrane and open the air passages. This may be used for adults or children.

Olive oil or cotton seed oil, 8 ounces.

To soothe irritated surfaces, such as the chafed skin of infants.

Warmed and dropped into the ear for earache.

As an enema, to soften impacted feces: ½ cup of warm oil retained for several hours or overnight, followed by soapsuds enema.

Oil of cloves, ½-ounce bottle. For toothache. Clean out the tooth cavity, insert a bit of cotton soaked in the oil and cover with dry cotton.

Borated talcum powder containing 10 per cent boric acid. For prevention and treatment of skin irritation, as in prickly heat.

DDT powder, 10 per cent in talcum. For lice. Several 2-ounce shaker-top cans.

Insect Repellent, "6-2-2" mixture. Several 2-ounce bottles.

Calamine lotion, 8-ounce bottle. For relieving skin irritation, as in ivy poisoning. (This should not be used on moist or hairy areas.)

Vaseline, 1 bottle.

For lubricating enema nozzles or rectal thermometers.

As a remedy for croup, 1 teaspoonful, melted, taken by mouth.

Boric ointment, one tube. As a soothing ointment.

Zinc oxide ointment, one tube. As a soothing ointment.

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For lubricating enema nozzles or rectal thermometers
As a remedy for croup 1 teaspoonful melted taken by mouth
Boric ointment one tube As a soothing ointment
Zinc oxide ointment one tube As a soothing ointment

A burn ointment such as Butesin picrate ointment or tannic acid jelly such as Amertan (the latter containing tannic acid should not be used on very extensive burns) 1 or more large tubes

Sulphur ointment 1 tube For acne or various parasitic skin diseases

Ammoniated mercury ointment 1 tube For impetigo and various parasitic skin diseases

Desenex ointment and Desenex powder 1 tube of the ointment and one can of powder For athlete s foot and other ringworm infections

FOR REGIONS WHERE MALARIA IS COMMON

Tablets of Aralen (Winthrop Stearns Inc New York) 0 25 gram (base 0 15 gram) This drug is also called Chloroquine 100 or 1000 tablets (A large supply is indicated when suppressive treatment will be needed)

or

Tablets of Chlorguanide hydrochloride in the form of Guanatol (Eli Lilly) or Paludrine (Imperial Chemicals Industries) 0 1 gram or 0 05 gram (for children) 100 or 1000 tablets

FOR REGIONS WHERE AMOEBIC DYSENTERY IS COMMON

Carbarsone capsules 0 25 gram 20 capsules or Vioform tablets 0 25 gram 100 tablets

FOR REGIONS WHERE BACILLARY DYSENTERY IS COMMON (and also for pneumonia blood poisoning and other serious infections where medical aid may not be available)

Sulfadiazine tablets 100 0 5 gram (7½-grain) tablets

FOR PIONEERS IN PLACES WHERE NO PHYSICIAN MAY BE AVAILABLE IN CASE OF SERIOUS EMERGENCIES

Hypodermic tablets of morphine sulphate 20 tablets ⅙ grain with Atropine sulphate 1/150 grain These can be used orally as well as by injection

Doses for children In some instances as in the case of paregoric children s doses are stated in this list Doses of anti malaria drugs and sulfadiazine for children are stated in the text It is also stated in the text that morphine should not be given to children *unless absolutely necessary* and then in small doses (see pages 97 and 98)

Young s Rule The proportion of the adult dose to be given to a child is usually computed by *dividing the child s age by the age*

plus 1 Example To find the dose for a child of three years in using a liquid medicine for which the adult dose is 1 teaspoonful

$\frac{3}{3+12} = \frac{3}{15} = \frac{1}{5}$ of 1 teaspoonful (60 drops) = 12 drops

Sometimes the medicine to be given is dry To a limited extent large tablets such as those of aspirin can be broken into halves or quarters using a knife or scissors blade For fractions of powders or tablets which can be reduced to powder use a table knife to arrange the powder in the form of a square or oblong plaque on a piece of paper Then divide this plaque into the desired number of portions which are as nearly equal as possible

If the amount of the adult dose is too small to be easily divided it may be diluted with powdered sugar mixing the ingredients as thoroughly as possible Then the mixture can be apportioned as desired

Better than this method in the case of soluble medicines is the expedient of dissolving the tablet or powder in a definite amount of water measured in drops or teaspoonfuls Afterward the solution can be divided into the desired number of equal parts

II WEIGHTS AND MEASURES

The metric system is understood throughout the world At present however the apothecaries system is very frequently used in the United States and Great Britain

The following tables are supplied in order that doses given in this book may be understood and converted if necessary into those of the other system

APOTHECARIES SYSTEM

Weight

60 grains	equal	1 dram
8 drams		1 ounce
12 ounces		1 pound (troy)

Volume

60 minims	equal	1 fluid dram (usually called 1 dram)
8 fluid drams		1 fluid ounce (usually called 1 ounce)
16 fluid ounces		1 pint
2 pints		1 quart
4 quarts		1 gallon

METRIC SYSTEM

Weight

10 milligrams (abbreviation mg) equals 1 centigram NOTE 1 milligram may be written 0 001 gm and 1 centigram 0 01 gm[4]

10 centigrams	equal	*1 decigram (0 10 gm)*
10 decigrams		1 gram (1 0 gm)
1000 gm		*1 kilogram (1 kg [kilo])*

Volume

1000 cubic centimeters (cc) equal 1 liter
(NOTE 1 cc of water weighs 1 gm)

COMPARISON OF APOTHECARIES AND METRIC MEASURES

Weight

Approximate Equivalents	
1 grain	0 06 gm
15 grains	1 00 gm.
1 dram	4 00 gm
1 ounce	30 00 gm
1 pound *(troy)*	360 00 gm
2 2 pounds (avoirdupois)	1 kilogram or 1000 gm

Volume

Approximate Equivalents	
1 minim	*0 06 cc.*
15 minims	1 00 cc
1 *fluid dram (or drachm)*	*4 00 cc*
1 fluid ounce	30 00 cc.
1 pint	480 00 cc.
33 8 fluid ounces	1000 00 cc. (1 liter)
1 *quart*	960 00 cc.

[4] *The abbreviation for gram (gm) should not be confused with grain (gr) of the apothecaries system*

HOW TO CALCULATE PERCENTAGES FOR DILUTION

In the metric system this is self-evident (e g 1 per cent of 100 cc. is 1 cc 5 per cent of 100 cc is 5 cc)

In the apothecaries system a 1 per cent solution always contains 5 grains to the ounce Thus to make a 10 per cent solution of argyrol 10 times 5 grains or 50 grains of argyrol are added to an ounce of distilled water

HOUSEHOLD MEASUREMENTS

For the use of those who have no scales or measuring glasses

Liquids

1 drop may be considered for practical purposes about 1 minim or 0 06 cc.

1 teaspoon filled to the brim may be considered 1 fluid dram (60 drops) or 4 cc a heaping teaspoonful of dry material 5 cc

1 *tablespoonful is about 4 fluid drams or 15 cc*

1 teacup usually holds about 4 ounces Kitchen measuring cups have a capacity of 8 ounces Whenever possible the measuring cup should be used for measuring amounts rather than the tea cup In this book one cup means a measuring cup or 8 ounces or 240 cc

1 glassful meaning a glass of ordinary size used for drinking water may be considered to be 8 ounces or 240 cc

Solids

1 dram of a powder equals roughly	1 level	teaspoonful
1 ounce	8	teaspoonfuls

[1] In reality the size of drops varies according to viscosity specific gravity and the temperature of the fluid

APPENDIX D

GLOSSARY

ALLERGY A hypersensitivity to certain substances

AMBULATORY Walking about said of a disease which is so mild that the patient is able to walk about.

ARTHRITIS. Inflammation of a joint.

BACTERIOPHAGE. An agent which destroys bacteria possibly owing its action to a parasite of parasites.

BAKING SODA. Bicarbonate of soda

CARDINAL SYMPTOMS Pre-eminent symptoms

CARRIER An infected person who is not himself ill at the time but is able to infect other persons

COMPOUND FRACTURE. A fracture having an open wound of the flesh leading to the break in the bone.

CONNECTIVE TISSUE The binding tissues of the body such as the loose tissue binding the skin to the muscles underneath

CONTAGIOUS Transmissible by contact with an infected person

CYST A cavity containing fluid and surrounded by a capsule Also the form the amoeba histolytica assumes in *chronic* amoebic dysentery

CYSTOSCOPY Inspection of the interior of the bladder by means of an instrument called a cystoscope

DEFECATION Evacuation of the bowels

DROPLET INFECTION Infection through contact with the spray from the *mouth of an infected person when* coughing talking or sneezing

ENDEMIC. Indigenous continually present in a community

EPIDEMIC. Attacking nearly simultaneously a large number of people

EXCRETA Excreted matter i e faeces and urine

FAECES OR FECES Matter discharged from the bowel during defecation

GENITALIA The sex organs.

HOST The organic body on which parasites live

INCUBATION PERIOD The period between the moment of infection and the appearance of symptoms

INFECTIOUS. Capable of infecting with or without actual contact

JAUNDICE. A yellow discoloration of the skin mucous membranes and the secretions due to bile pigment in the blood

LARVA (pl. larvae) The form that insects and animal parasites take in emerging from the egg

LATRINE A privy especially one in trough form

LITER 1000 cubic centimeters equal to 1.056 U.S quarts

LYMPH A clear fluid which circulates in the lymph vessels (lymphatics) of the body Lymph glands are small oval masses of lymphatic tissue occurring in the course of these vessels

MUCUS A viscid liquid secreted by the mucous membranes which line those cavities and canals of the body that communicate with the air

NARCOTIC. A drug producing stupor

NIGHT SOIL. Human excretions such as the contents of privy vaults.

NODULE. A small rounded tumor or lump of flesh

PAPULE A pimple

PARASITE An animal or vegetable organism that lives on or within another organism

PEPTIC ULCER. An ulcer of the lining membrane of the stomach or the adjoining portion of the small intestine

PHOBIA An unreasonable dread

RESIDUAL. Remaining to exert its effect over a considerable period of time

SCAVENGER SERVICE. The burying of the contents of commode pails at a distance from the residence

STOOL. The evacuation of the bowels.

SYNTHESIZE To form chemical compounds by the union of simpler compounds or elements

TOXIC. *Poisonous*

VIRUS A living organism too minute to be seen by *means of an ordinary* microscope

VOIDING Evacuation of the bladder

WASHING SODA Sodium carbonate

INDEX

NOTE Ital c page numbers when used refer to the main d scuss on of an item